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Nr. 5. A. C. Johansen: CONTRIBUTIONS TO THE BIOLOGY OF THE PLAICE WITH SPECIAL REGARD TO THE DANISH PLAICE-FISHERY. II. THE MARKING AND TRANSPLANTATION EXPERIMENTS WITH PLAICE IN THE DANISH WATERS IN THE YEARS 1903–06. (CONTAINING 6 PLATES AND 10 TEXT-FIGURES

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MEDDELELSER FRA KOMMISSIONEN FOR HAVUNDERSØGELSER
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CONTRIBUTIONS

TO

THE BIOLOGY OF THE PLAICE

WITH SPECIAL REGARD TO THE DANISH PLAICE-FISHERY

(CONTAINING 6 PLATES AND 10 TEXT-FIGURES)

II

THE MARKING AND TRANSPLANTATION EXPERIMENTS WITH PLAICE IN THE DANISH WATERS IN THE YEARS 1903-06

BY

A. C. JOHANSEN

KØBENHAVN
I KOMMISSION HOS C. A. REITZEL
BIANCO LUNOS BOGTRYKKERI
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I. Introduction.

1. The object of the marking experiments.

In the Danish marking experiments with plaice the fish were as a rule liberated at the same spot where they were captured. In some cases, however, the fish have been transported shorter or longer distances before liberation. The aim of those experiments where the fish were liberated at the place of capture was in the main as follows:

1) To throw light upon the intensity of fishing.
2) To contribute to our knowledge with regard to the rate of growth of plaice on the various fishing grounds.
3) To yield information with regard to the natural migration of plaice.
4) To procure information as to the nationality of the vessels which catch the majority of the plaice on the various fishing grounds.
5) To elucidate what proportion of the marked fish are caught by trawling-vessels and what proportion by cutters and smaller vessels in the various areas.

The transplantation experiments have also to some degree enabled us to obtain information regarding the circumstances mentioned under 1—5. The main object of these experiments has been, however, to procure information as to the prospect of profitable transplantation on a large scale in the sea, the plaice being removed from grounds where they are crowded and increase in growth slowly to areas where they are scarce and increase rapidly.

2. The method of marking.

In the marking experiments Dr. PETERSEN's method has been used. Two bone-buttons have been attached to the fish by means of a silver-wire passed through the interspinous bones near the dorsal-fin, somewhat nearer the head than the tail. The bone-button on the eye-side is provided with a small depression wherein is placed a brass-disc provided with a number. The same method of marking is used in England, Belgium, Holland and Sweden, with some slight modifications. This method has on the whole proved to he practical, though not perfectly satisfactory in all respects. If the results of a marking experiment are to be called satisfactory we may make the following claims:

a) The labels must be sufficiently large and distinct to be easily discovered by the fishermen or the people who later on manage the fish.

In this direction the Danish labels are quite good.

b) The labels must be constructed and fixed in a way that does not much injure the fish.

The Danish method of marking may also in this respect be called satisfactory. When the buttons have not been squeezed too tight to the fish we very rarely observe a serious wound caused

by the labels. Another evidence that the marked fish are in good health we possess in the fact that they grow on an average with a similar rapidity to those not marked.

c) The labels must be made of such a material and fixed on the fish in such a manner that they will last as long as the specimen lives.

In this respect we are still far from the ideal. We may at present be quite content if the labels remain on the fish for one year, so that we may get information as to what degree the fishery has affected the stock thoughout the year. Experience has shown that the labels generally last at least for one year. After 1—2 years, however, the bone button on the blind side is generally corroded by the sea water, and no label is known to have lasted for more than $2^3/_4$ years. But even if the label is rather durable the fish may lose it because it has not been sufficiently well fixed. It is sometimes noticed, especially in smaller specimens, that the silver wire which fixes the label has caused a longitudinal wound between the interspinous bones so that the label has moved out against the edge of the body. Several labels are probably lost in this way before one year has passed.

3. The condition of the marked fish when set free.

It is naturally of the utmost importance that the marked fish should be liberated in a perfectly living condition. This has generally been the case in the Danish marking experiments; but in spite of the care we have taken on this point, it seems that we have not always been careful enough. Thus it has been ascertained that a few of the marked plaice have been taken dead from the sea-bottom shortly after liberation. I therefore suppose GARSTANG to be right when he says that "it is quite possible that a certain number of fishes receive injuries during the act of trawling which are incapable of detection at the time when the fish are marked and yet may be severe enough to cause a certain mortality among the fish used in the experiments".

While it is quite exceptional that marked plaice have been liberated in the ordinary marking experiments when not capable of living, we have reason to suppose that the condition of the plaice which were liberated in the Danish transplantation experiments in spring of 1904, has not always been as satisfactory as it ought to have been. The slight percentage which has been recovered of these transplanted fish points in this direction. The weather was very unfavourable during several of these experiments, and it became in several cases evident that the plaice were weakened during the transplantation.

It seems as if I have in some cases overestimated the vitality of the plaice. I have thought that, even if a plaice has become a little weak during the transport, it will soon recover when placed in the sea. Experience seems to show that such has not always been the case.

The plaice liberated in the marking experiments were as a rule caught by the "Thor" with a 50 feet ottertrawl in hauls lasting from ca. $^1/_2$—2 hours. In some cases they were captured in the snurrevaad by Danish cutters.

4. The areas where the marked fish have been set free.

The Danish marking experiments with plaice in 1903—1906 were made in the following areas:

1) In the North Sea N. of 55°0′ N. lat. and E. of 6°0′ E. long.
2) In the southern Skagerak on the Danish land-ground at depths between 0 and 50 meters.
3) In the Kattegat west of a line drawn from Elsinore over Little Middelgrund to 58°0′ N. lat. and 11°0′ E. long.

In that part of the North Sea where the marking experiments were made we may distinguish between two areas: The Horns Reef area and the Hanstholm-Søndervig area. The Horns Reef area comprises the grounds around the Horns Reef and the so called "Horns Reef Outer Grounds", lying

between 55°0′ and 56°0′ N. lat. and E. of 6°0′ E. long. The Hanstholm-Søndervig area comprises the coastal grounds off the west coast of Jutland between 56°0′ and 57°10′ N. lat. and E. of 6°0′ E. long.

As limits between the different waters are here considered:

Line: Hanstholm—Lindesnæs between the North Sea and the Skagerak.
» Skagen—Paternoster » the Skagerak and the Kattegat.
» Gniben—Hasenøre » the Kattegat and the Belt Sea.
» Elsinore—Helsingborg » the Kattegat and the Sound.
The submarine ridge: Dragør—Saltholm—Linhamn between the Sound and true Baltic.
» Gedser—Darsserort » the Belt Sea and true Baltic.

5. The records of the fishermen and the registration of the data etc.

The Danish fishermen and fishmongers have on the whole shown a praiseworthy readiness in sending information regarding recovered marked fish, in spite of the fact that the reward offered has been rather low (1 Kr.). It has sometimes occurred that we have by chance obtained information that marked fish had been recovered, though no information was sent to our office. Such occurrences are however rare exceptions. More than 90% of the marked fish are in several of our marking experiments registered as recovered, a fact which shows the fishermen's and the fishmongers' readiness in sending accounts of the recaptures.

At the most important fishing ports we have had local assistance from people, who received the fish from the fishermen, measured them and paid the reward. In Frederikshavn we have thus been assisted by Mr. Cloos Lorentzen, in Skagen by Mr. L. Holst, and in Esbjerg by the harbour master Lieutenant Jensen.

For information regarding Danish marked fish recovered by foreign fishermen we are indebted to the authorities in the respective countries, who have had these matters in their charge.

6. The shrinkage of fish after death before remeasurement.

The fish recovered during the same month in which they were liberated measure on an average ca. 0·5 cm. less at recovery than at liberation (Compare Contributions I, p. 23). This is naturally owing to shrinkage after death before the remeasurement takes place. Several specimens measure up to 2 cm. less on remeasurement after recovery than at liberation. In accordance with the experience gained and with the results of several experiments which we have undertaken in order to substantiate the amount of shrinkage when the fish were dried I have summed up the following as giving approximately the real size of the fish at recovery:

If stated: "fish fresh" or "fish living":	0	cm. is added.
If nothing stated about condition of fish:	0·5	» »
If stated: "tail dry":	0·5	» »
If stated: "fish rotten":	1·0	» »
If stated: "fish dry" or "fish salted":	1·0	» »

This implies that on an average 0·5 cm. has been added to the observed length of the recaptured fish by the calculation of the growth.

The fish has in each case been calculated to be at least as large on recovery as at liberation.

Among the experiments which we have carried out to test how much the plaice will shrink when dried up, the following may be recorded.

On October 2., 1906, 11. a. m., 30 living plaice of a length of 21—36 cm. were laid out on the deck of the "Thor".

They were left on the deck for 24 hours in fine weather; then they were remeasured and the shrinkage amounted to 4—9 mm., on an average to 5·6 mm. The majority of the marked plaice landed in Esbjerg are in a similar state.

The 30 specimens were now utterly dried up and on October 12. they were in such a state that they properly might be termed as "Fish dry" or "Fish somewhat dry". The shrinkage now amounted to between 7 and 13 mm., on an average to 9·6 mm.

The shrinkage of each of the individuals was as follows:

Original length 2. — 10. — 06.	Shrinkage until 3. — 10. — 06.	Shrinkage until 12. — 10. — 06.	Original length 2. — 10. — 06.	Shrinkage until 3. — 10. — 06.	Shrinkage until 12. — 10. — 06.
213 mm.	6 mm.	9 mm.	257 mm.	6 mm.	11 mm.
218 »	6 »	8 »	260 »	6 »	8 »
226 »	6 »	10 »	265 »	9 »	12 »
228 »	6 »	9 »	268 »	7 »	11 »
234 »	8 »	11 »	269 »	6 »	13 »
235 »	4 »	9 »	270 »	5 »	9 »
235 »	4 »	9 »	272 »	6 »	9 »
239 »	8 »	13 »	274 »	4 »	8 »
241 »	4 »	9 »	276 »	5 »	10 »
241 »	5 »	11 »	284 »	4 »	9 »
244 »	4 »	8 »	287 »	6 »	10 »
250 »	4 »	9 »	315 »	4 »	10 »
252 »	5 »	8 »	316 »	6 »	10 »
254 »	5 »	7 »	317 »	5 »	9 »
256 »	6 »	10 »	364 »	9 »	10 »

On salting and drying 9 plaice of a length of 22—28 cm. we found a shrinkage between 7 and 12 mm., on an average 9 mm. in the lapse of 4 weeks. The fish were at that time not quite dry.

7. Particulars concerning the Tables, Figures and Plates.

In the Tables stating the particulars of liberation and recovery of the marked plaice S. S. and S. T. mean steam-ship or steam trawler, S. B. = Decked or sailing boats (cutters), "Fishingb." means small sailing boats or small motor boats (below 10 tons brutto). The tables include recoveries up to the end of September, 1906.

The charts illustrating the marking experiments have been drawn by Mr. SIMONSEN.

On all the charts the head of the arrow indicates the position of recapture. The letters beside the arrow heads represent the nationality of the vessels which recaptured the plaice, B. meaning Belgium, Da. = Denmark, E. = England, H. = Holland, G. = Germany, S. = Sweden. The Arabic numerals at the arrow-heads indicate the number of months between liberation and recapture, 0 meaning: recaptured in the same month as liberated, 1 meaning: recaptured 1 month after liberation and so on.

The Figures 1 to 9 represent the plaice which were recaught until June 30., 1905. The Figure 10 and Pl. I to VI represent plaice recaught until Septbr. 30., 1906.

The depth-lines are the same on the Figures as on the Plates.

II. Detailed account of the Danish marking and transplantation experiments with plaice in the North Sea, the Skagerak and the Kattegat in the years 1903—1906.

A. The ordinary marking experiments in 1903. Supplementary records.

In April of 1903, 1220 marked plaice were liberated from the investigation-steamer "Thor" off the west-coast of Jutland in the shore belt between 8 and 50 meters depth. At the end of 2 months and a half after the liberation 304 of the marked specimens or ca. 25 % were already recovered. In the first year after liberation 361 specimens or 29·6 % were recovered, in the second year 32 specimens or 2·6 %, and in the third year 4 specimens or 0·3 %. The last specimen recovered was caught on July 28th, 1905. Until September 30th, 1906, the total recatch amounted to 397 or 32·5 %.

In "Contributions to the Biology of the Plaice I" I have dealt with the marking experiments of 1903 and given particulars with regard to the specimens recovered up to the end of June, 1904. The following supplementary records comprise one specimen recaught in April of 1904 and 8 specimens recaught between July 7th of 1904 and July 28th of 1905. These specimens are of special interest on account of the proportionally long time which has passed between the liberation and the recovery.

Table 1. Supplementary list of Recoveries from the Danish marking experiments with plaice in April, 1903.

Particulars of Liberation. Date. Locality.	Particulars of Recovery									
	Date	Nr. on Label	Locality reported	Central Position (Approximately) N E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
Marking experiment No. 2 1903 SE of Vyl. April 10, 1903	1904 April 12	41	10 miles S of Vyl Lightship	55°15′ 7°51′	English S. S.	XII	♂	23	26·5	
	1905 July 28	238	60 miles WSW of Graadyb. 15 fms.	65°08′ 7°33′	Danish S. B.	XXVII	♂	17	27	
Marking experiment No. 3 1903 SE of Vyl. April 10, 1903	1905 May 1	626	55°40′ N 7°25′ E. 8 fms.	55°40′ 7°25′	English S. T.	XXV	♂	24	31·5	dried and salted
	» June 16	662	55°20′ N 7°50′ E. 13 fms.	55°20′ 7°50′	» »	XXVI	♀	17	34*	*fide* fisherman.
Marking experiment No. 5 1903 N of Tuxen, Horns Reef. April 11, 1903	1904 Aug. 3	891	12 miles W of Husby. 12½ fms.	56°08′ 7°49′	Danish S. B.	XVI	♂	30	...	
	1905 Febr. 6	836	70 miles NW by W of Helgoland	54°38′ 6°04′	German S. S.	XXII	♂	24	37	
	» May 18	725	55°16′ N 4°49′ E. 25 fms.	55°16′ 4°49′	English S. S.	XXV	♂	26	37	
Marking experiment No. 7 1903 Jammer Bay. April 17, 1903	1904 July 7	1003	NNE of Hanstholm. 24 miles f. shore. 22 fms.	57°30′ 8°44′	Danish S. B.	XV	♂	20	35	
Marking experiment No. 16 1903 Off Torup. April 23, 1903	1904 July 17	1166	Monkey Bank	56°30′ 6°30′	German S. T.	XV	♀	35	41	

It will be seen from Table 1 that 5 specimens liberated in the Horns Reef area have grown after ca. 2 years respectively 8, 10, 11, 13 and 17 cm. One specimen liberated in Jammer Bay in the Skagerak increased in size during 15 months from 20—35 cm.

Fig. 1 represents the position of recapture of the above mentioned plaice which were liberated in April, 1903, and recovered between 15 and 26 months after the liberation. It will be noticed that all the specimens save one were recovered in deeper water than that in which they were liberated. This corresponds with the general tendency of the plaice to leave the shallow water as it increases in size. At the end of 25 and 26 months 2 specimens were recovered on the Horns Reef grounds where

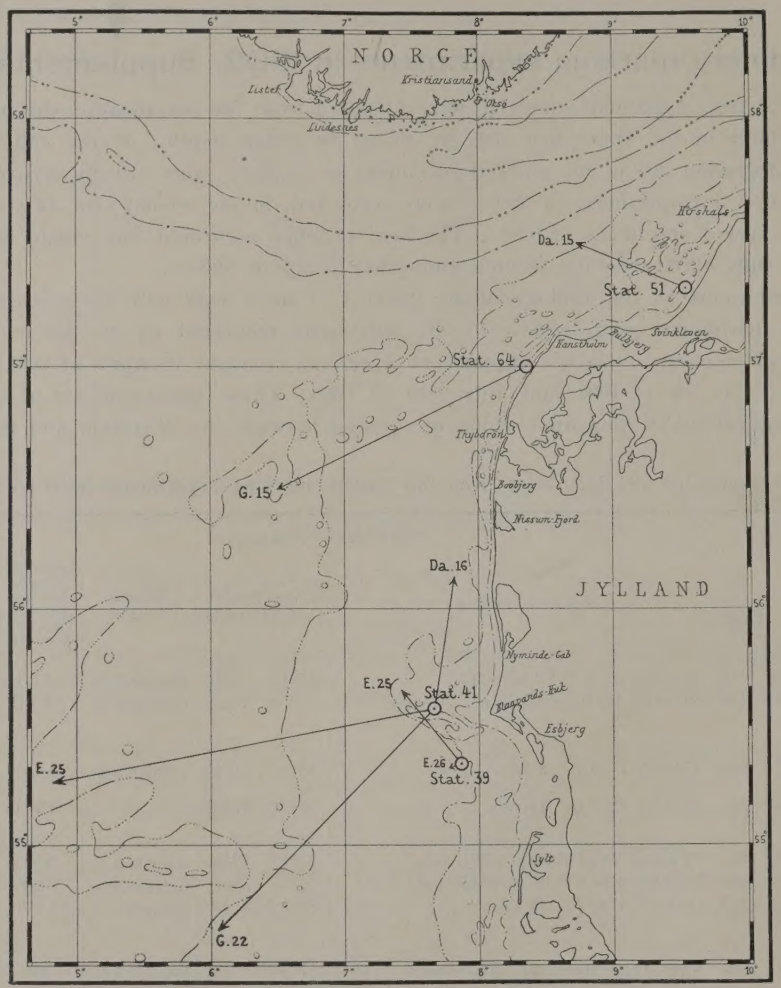

Fig. 1. Marking experiments with plaice. April 1903. Supplementary chart.

they were liberated originally. How far these plaice have been wandering to and fro from shallow to deeper water during the 2 years can naturally not be ascertained.

B. The ordinary marking experiments in the spring of 1904.

In the ordinary Danish marking experiments in February and March, 1904, 210 specimens were liberated near the Horns Reef and 90 specimens in the north-western Kattegat.

A detailed account of the experiments is represented on the Tables 5 and 6. The list of recap-

tures of the marked fish is here entered up to the end of September, 1906 and thus comprises a space of ca. $2^1/_2$ years.

Of the 210 specimens liberated at Horns Reef in February, 76 specimens or ca. 36·2 % were recovered by the end of one year. During the second year 10 specimens or ca. 5 % were recovered. The total recaptures until September 30th of 1906 amounted to 86 specimens or 41·0 %. 159 of the specimens measured at liberation 19—24 cm. and 51 specimens measured 25—31 cm. In one year 39 specimens or 24·5 % were recovered of the first group and 37 specimens or 72·5 % of the latter group.

The growth of the specimens liberated at Horns Reef is represented on Table 2. It will be seen that the increase here during the summer amounted to ca. 6 cm. for specimens of a total length of 20—30 cm. and that apparently no increase has taken place during the winter months of 1904—1905.

Marked plaice were also liberated by Germany in the Horns Reef area in the spring of 1904. 264 specimens were thus liberated W. and S.W. of Horns Reef at 23—30 meters depth. During the first year after liberation 86 of these specimens or 32·6 % were recaptured. As shown on Table 3 the average increase was 3·5 cm. for 4 specimens of 28—31 cm. which were recaptured in July and August 1905, while the average increase was 5 cm. for 10 specimens of 20—27 cm., which were recaptured during the same months in the Danish marking experiments.

Of the 90 specimens liberated in the marking experiments in the northern Kattegat 76 specimens or 84·4 % were recovered during one year. In the following year only one specimen was recaptured. Until September 30th of 1906 the total recaptures amounted to 77 specimens or 85·6 %.

Of the marked specimens 35 measured at liberation 21—24 cm. and 55 25—32 cm. In the course of one year 30 specimens or 85·7 % were recaptured of the first group and 46 specimens or 83·6 % of the last group.

A survey over the growth of the specimens liberated in the northern Kattegat is represented on Table 4. The increase during the summer seems to be ca. 5—7 cm. for specimens of an average length of 22—25 cm.

A further account of the results of the marking experiments in spring, 1904 will be found in Chap. III: "Discussion of the Results of the Danish marking experiments with Plaice in the years 1903—1906".

Table 2. Rate of Growth of plaice liberated in the Horns Reef Area. February, 1904. Ordinary Danish marking experiments No. 1 & 2.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. Febr. 22.—24.	1904 March	1 month	0·1	0	0·5	11	24·2	21	27
	» April	2 months	0·4	0	1·0	23	25·6	21	31
	» May	3 »	0·8	0	2·0	15	24·7	20	29
	» June	4 »	1·4	1	1·5	5	22·4	20	25
	» July	5 »	5·0	4	6·0	5	24·0	20	27
	» August	6 »	5·1	3	6	5	23	21	27
	» Septbr.	7 »	6·2	3·5	8·5	3	26·7	22	30
	» October	8 »	3·0	...	...	1	19	..	..
	» November	9 »	5·8	5	6·5	2	23	20	26
	1905 March	13 »	5	...	...	1	21	..	..
	» April	14 »	5	...	...	1	20	..	..
	» May	15 »	8·2	7·5	8·5	3	22·7	22	23
	» June	16 »	9·5	9	10	2	20·5	20	21
	» July	17 »	9·5	...	...	1	21	..	..
	» August	18 »	13	...	...	1	21	..	..
	» November	21 »	11	...	...	1	28	..	..

Table 3. Rate of Growth of plaice liberated in the Horns Reef Area on March 18., 1904. German marking experiments No. 38—41. Compiled from Bolau.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. March 18.	1904 April	1 month	0·9	0	2·5	23	27·1	21	33
	» May	2 months	1·0	0	2·5	29	27·3	19	33
	» June	3 »	1·2	0	3·5	11	25·1	21	31
	» July	4 »	4·5	2·5	6·5	2	28	28	28
	» August	5 »	2·5	2·5	2·5	2	30·5	30	31

Table 4. Rate of Growth of plaice liberated in the northern Kattegat on March 5.—14., 1904. Ordinary marking experiments No. 3, 4, 5.

Date liberated	Month recovered	Period of Growth	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. March 5.—14.	1904 April	1 month	0 6	0	1·5	21	25·8	22	31
	» May	2 months	1·7	1·5	2	3	24·3	24	25
	» June	3 »	2·4	0·5	4	14	24·5	21	27
	» July	4 »	4·1	2 5	6·5	10	24·1	22	26
	» August	5 »	3·5	...	...	1	28	..	..
	» September	6 »	7	...	...	1	24	..	..
	» October	7 »	6·5	...	...	1	22	..	..
	1905 July	16 »	3·0	...	...	1	22	..	.

Table 5. Table showing the size of plaice at liberation and the specimens of the various size-groups recaptured up to September 30., 1906. The marking experiments in the spring of 1904.

	Horns Reef area								North-West Kattegat											
	Marking exper. No. 1				Marking exper. No. 2				Marking exper. No. 3				Marking exper. No. 4				Marking exper. No. 5			
	♂		♀		♂		♀		♂		♀		♂		♀		♂		♀	
	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.
19 cm.	2	1	1	..	1	..	..	.	.	..	.	..	..	.	..	..	..	..	..	..
20 »	19	6	17	6	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
21 »	29	4	20	4	4	1	1	..	1	1	..	..	1	1	..	..	..	..	..	..
22 »	16	5	13	3	3	2	2	1	1	1	3	3	1	1	..	..	1	1	1	1
23 »	5	3	11	5	..	..	1	1	1	1	3	3	..	..	1	1	1	1	..	..
24 »	4	2	5	2	1	..	2	2	4	4	5	4	2	1	2	1	3	2	4	4
25 »	4	2	3	2	3	2	1	2	1	1	3	2	1	..	1	1	1	1	9	9
26 »	7	5	2	1	1	1	2	2	3	1	1	1	..	..	2	1	3	3	5	3
27 »	4	3	2	2	2	2	5	3	..	..	2	2	1	1	1	..	3	3	5	5
28 »	1	1	..	..	2	1	7	5	..	..	..	..	3	3	1	1	..	..	1	1
29 »	..	..	..	..	2	1	..	..	..	..	2	1	1	1	..	..	1	1	..	..
30 »	..	..	..	..	1	1	1	1	.	..	..	..	..	..	..	..	1	1	..	..
31 »	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	1
32 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..
Total ...	91	32	74	25	21	11	24	18	11	9	19	16	10	8	10	7	14	13	26	24

Table 6. Table showing particulars of Liberation and Recapture of plaice in the ordinary marking experiments. February and March, 1904.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery									
	Date	No. on Label	Locality reported	Central Position (Approximately)	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
				N E						
1904. February 22—23. 7 miles SbyW½W from Blaavands Point. 55°27′ N 8°4′ E 14 meters. "Thor" St. 192, a & b. 165 plaice liberated (No. 1—65 and No. 101 — 200). "Thor"'s marking experiment No. 1 1904	1904 March 4	32	5 miles SSW from Cancer. 9 fms.	55°26′ 7°59′	Danish S. B.	I	♂	22·5	22	
	» » 4	102	5 miles SW from Cancer. 9 fms	55°25′ 7°55′	» »	I	♂	27	26·5	
	» » 6	4	10 miles W by N from Graadeep. 8 fms	55°27′ 8°0′	» »	I	♂	24·5	23·5	
	» » 8	22	8 miles W from the bell buoy Graadeep. 9 fms	55°25′ 7°59′	» »	I	♂	26	26	
	» » 8	108	8 miles W from the bell buoy Graadeep. 9 fms	55°25′ 7°59′	» »	I	♂	26·5	25·5	
	» » 10	188	8 miles W by S from Graadeep. 8 fms	55°25′ 8°3′	» »	I	♀	24	23·5	
	» » 11	48	3 miles E from Vyl Light-ship. 9½ fms	55°25′ 7°54′	» »	I	♀	21	21	
	» » 17	107	2 miles ESE from Vyl Light-ship. 10 fms	55°24′ 7°52′	» »	I	♂	25	24·5	
	» » 20	190	2 miles W from Vyl Light-ship. 11 fms	55°25′ 7°43′	» »	I	♀	21	21	
	» » 23	5	Lat. 55°27′ N Long. 7°45′ E	55°27′ 7°45′	English S. S.	I	♂	26	25·5	fish sound
	» April 15	7	10 miles WSW from Vyl Light-ship. 12½ fms	55°19′ 7°33′	Danish S. B.	II	♀	23·5		
	» » 19	115	½ mile W from Graadeep. 7 fms	55°26′ 8°14′	» »	II	♀	24·0	23·5	
	» » 19	123	1 mile NW from the bell buoy Graadeep. 6 fms	55°26′ 8°12′	» »	II	♂	23	22	
	» » 20	3	½ mile NE from the bell buoy Graadeep	55°27′ 8°14′	» »	II	♂	22·5		
	» » 20	198	1 mile W from the bell buoy Graadeep. 6 fms	55°26′ 8°12′	» »	II	♀	23	22·5	
	» » 21	23	1 mile W from the bell buoy Graadeep. 6 fms	55°26′ 8°12′	» »	II	♂	26·5	26·5	
	» » 21	26	4 miles WSW from Cancer. 7 fms.	55°25′ 7°58′	» »	II	♂	27·5	27·5	
	» » 21	50	1 mile S from Cancer. 7 fms	58°28′ 8°2′	» »	II	♂	28	28	
	» » 21	113	6 miles S from Blaavands Point. 4 fms	55°29′ 8°7′	» »	II	♂	24	23·5	
	» » 21	179	2 miles SE by E from Cancer. 5½ fms	55°28′ 8°3′	» »	II	♂	22	21·5	
	» » 22	103	3 miles S from Blaavands Point. 4 fms	55°30′ 8°6′	» »	II	♂	26	25·5	
	» » 22	125	2 miles NW from Graadeep. 8 fms	55°26′ 8°11′	» »	II	♂	21	21	
	» » 23	119	3 miles S by W from Blaavands Point. 4 fms	55°30′ 8°5′	» »	II	♂	27	27	
	» » 24	109	1 mile W from Slugen N. 8 fms	55°35′ 7°49′	» »	II	♀	23	22·5	
	» May 3	16	7 miles off Fanø		German S. S.	III	♀	20		
	» » 4	166	At Esbjerg. 1 fathom	55°28′ 8°26′	Dan. Fishingb.	III	♀	20	19·5	
	» » 6	42	6 miles W from Graadeep. 7½ fms	55°26′ 8°6′	Danish S. B.	III	♀	20·5	21	
	» » 6	49	1 mile W from Slugen N. 13 fms	55°35′ 7°48′	» »	III	♀	27·5	28	
	» » 9	186	1 mile N from Cancer. 7 fms	55°30′ 7°59′	» »	III	♀	25	24·5	
	» » 9	29	5 miles WNW from Cancer. 7 fms	55°32′ 7°55′	» »	III	♂	20·5	20·5	
	» » 27	10	5 miles SW from Sønderho, Fanø	55°19′ 8°20′	» »	III	♂	23	23·5	
	» » 27	114	Off Nymindegab. 4 miles from shore. 6 fms	55°48′ 8°5′	» »	III	♀	26·5	26	
	» » 28	120	3 miles SW from Cancer. 8 fms	55°26′ 7°58′	» »	III	♀	20·5		
	» June 2	21	3 miles WNW from Kærgaarde Bn. 5½ fms	55°43′ 8°7′	» »	IV	♀	22	23	
	» » 2	105	9 miles SW from Graadeep. 9 fms	55°22′ 8°8′	» »	IV	♀	25	26	
	» » 2	127	4 miles SW by S from Fanø sea-water bath	55°22′ 8°20′	» »	IV	♀	20	21	
	» » 7	45	4 miles SW from Blaavands Point. 7 fms	55°31′ 8°2′	» »	IV	♂	25·5	26	
	» » 20	171	Vyl Lightship bearing NE dist. 8 miles. 10 fms	55°18′ 7°39′	English S. T.	IV	♂	22·5	[28]	
	» » 30	43	Lat. 56°10′ N Long. 7°25′ E. 18 fms	56°10′ 7°25′	» »	IV	♂	20·5	21	fish dry
	» July 13	51	25 miles N from Slugen. 14 fms	55°59′ 7°48′	Danish S. B.	V	♀	27	32	
	» » 16	17	16 miles SSW from Klegod Bn. 12 fms	55°50′ 7°58′	» »	V	♀	20·5	24	
	» August 3	178	12 miles W from Husby. 12 fms	56°10′ 7°55′	» »	VI	♂	20·5		
	» » 4	2	12 miles W from Klegod Bn.	56° 5′ 7°45′	» »	VI	♂	23	27·5	
	» » 4	104	12 miles W from Klegod Bn.	56° 5′ 7°45′	» »	VI	♂	22·5	25	
	» » 25	58	8 miles NW from Klegod Bn. 12 fms	56° 7′ 7°52′	» »	VI	♂	21	26·5	
	» Sept. 20	9	3 miles NW from Nymindegab. 8 fms	55°50′ 8°6′	» »	VII	♀	22	28	
	» October 3	36	10 miles N from Horns Reef L. V.	55°44′ 7°17′	German S. S.	VIII	♂	19·5	22	
	» Nov. 1	162	20 miles NE from Horns Reef L. V. 11 fms	55°51′ 7°40′	Danish S. B.	IX	♂	20	24·5	
	1905 March 4	140	10 miles WSW from Vyl Light-ship. 12½ fms	55°19′ 7°32′	» »	XIII	♂	21	25·5	
	» April 27	14	6 miles SW from Blaavands Point. 6 fms	55°30′ 7°57′	» »	XIV	♂	20	24·5	
	» May 5	47	3 miles W from Slugen N. 7 fms	55°35′ 7°44′	» »	XV	♀	22	30	
	» » 8	111	1 mile NW from Slugen N. 7 fms	55°35′ 7°46′	» »	XV	♀	23	31	
	« » 29	56			English S. S.	XV	♀	23·5	30·5	fish sound
	» June 1	121	Lat. 55°25′ N Long. 7°50′ E. 10 fms	55°25′ 7°50′	» »	XVI	♂	21·5	30	fish sound
	» » 5	62	10 miles SW from Graadeep. 12 fms	55°17′ 8°0′	Danish S. B.	XVI	♂	20·5	30	
	» July 7	59	18 miles SW from Graadeep. 12 fms	55°16′ 7°57′	» »	XVII	♀	20		
	» August 18	54	Lat. 54°38′ N Long. 4°55′ E. 18—20 fms	54°38′ 4°55′	English S. T.	XVIII	♂	21·5	34	

Table 6. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1904. Febr. 24. 3½ miles W¾S from Kærgaarde Bn. 55° 42′ N 8°4′E. 15 meters. "Thor" St. 195. 45 plaice liberated (No. 441—485). "Thor"s marking experiment No. 2 1904.	1904 March 20	475	1 mile NW from Slugen N. 13 fms	55°35′	7°49′	Danish S. B.	I	♀	24·5	24	
	» April 12	443	3 miles NW from Slugen N. 10 fms	55°36′	7°45′	» »	II	♀	22·5	21·5	
	» » 18	469	3 miles N from Blaavands Point. 7 fms	55°38′	8°0′	» »	II	♀	27	26·5	
	» » 21	468	4 miles WSW from Cancer. 7 fms	55°26′	7°56′	» »	II	♀	31	31	
	» » 22	456	6 miles NW from Graadeep bell buoy. 6 fms	55°29′	8°7′	» »	II	♂	25·5	25·5	
	» » 23	445	2 miles SW from Cancer. 6½ fms	55°27′	7°59′	» »	II	♀	30·5	32	
	» » 23	472	3 miles SW from Blaavands Point. 4 fms	55°30′	8°5′	» »	II	♀	25	25·5	
	» » 24	453	16 miles WSW from Graadeep bell buoy. 12 fms	55°20′	7°48′	» »	II	♂	26	26	
	» » 27	455	2 miles SE from Cancer. 7 fms	55°28′	8°4′	» »	II	♀	26	26	
	» » 29	479	3 miles S by W from Blaavands Point. 4 fms	55°30′	8°5′	» »	II	♀	27	27·5	
	» » 30	450	1 mile NW from Slugen N. 7 fms	55°35′	7°48′	» »	II	♀	28·5	28	
	» » 30	473	1 mile W from Cancer. 14 fms	55°30′	8°0′	» »	II	♂	28	28·5	
	» May 6	447	1 mile NW from Munk buoy. 10 fms	55°32′	7°51′	» »	III	♀	28	29	
	» » 9	446	4 miles WNW from Cancer. 7 fms	55°31′	7°54′	» »	III	♀	28	28·5	
	» » 13	460	2 miles NW from Graadeep bell buoy. 8 fms	55°27′	8°9′	» »	III	♂	21	21·5	
	» » 21	452	3 miles S from Cancer. 7 fms	55°26′	8°1′	» »	III	♀	23·5	23·5	
	» » 23	477	1 mile WSW from Nymindegab. 7 fms	55°49′	8°8′	» »	III	♂	25·5	26	
	» » 24	441	2 miles W from Kærgaarde Bn. 5½ fms	55°42′	8°6′	» »	III	♂	29	30·5	
	» » 25	465	1 mile W from Slugen N. 8 fms	55°35′	7°49′	» »	III	♂	27	27	
	» » 25	480	5 miles NW from Blaavands Point. 6 fms	55°35′	7°56′	» »	III	♀	28·5	29	
	» July 17	484	8 miles W by N from Vedersø Bn.	56°15′	7°43′	» »	V	♀	24	28·5	
	» » 28	474	The North Sea			German S. T.	V	♀	27	31	
	» » 29	457	11 miles W by N from Klegod Bn.	56°5′	7°47′	Danish S. B.	V	♂	22·5	28	
	» August 13	458	Lat. 56°6′ N Long. 7°57′ E. 13 fms	56°6′	7°57′	English S. S.	VI	♂	22	27·5	fish sound
	» » 23	451	Lat. 56°45′ N Long. 6°25′ E. 26 fms	56°45′	6°25′	» »	VI	♂	27	32	fish sound
	» Sept. 2	463	2 miles W from Klegod. 11 fms	56°4′	8°0′	Danish S. B.	VII	♀	28	36	
	» » 13	448	Locality unknown			English S. S.	VII	♂	30	33	fish sound
	» Nov. 11	449	Lat. 55°37′ ½ N Long. 4°41′ ½ E. 19 fms	55°37′	4°41′	» »	IX	♀	26·5	32·5	fish sound
	1905 » 2	467	Lat. 54°22′ N Long. 3°40′ E. 23 fms	54°22′	3°40′	» »	XXI	♂	28	38·5	mature
1904. March 5. Læsø Rende. 57°15′ N 10°43′ E. 16 meters. "Thor" St. 206, a & b. 30 plaice liberated (No. 1851 — 1880). "Thor"s marking experiment No. 3 1904.	1904 March 12	1863	Læsø Rende. 11 fms			Danish S. B.	0	♀	29·5	30	
	» » 14	1875	Læsø Rende, off Sæby. 11 fms	57°20′	10°43′	« »	0	♂	24	23·5	
	» » 23	1880	At Kobbergrunden. 8 fms	57°11′	11°18′	Swedish S. B.	0	♀	23·5	24·5	
	» » 25	1858	Between Læsø and Sæby. 12 fms	57°20′	10°43′	Danish S. B.	0	♂	26	26	
	» » 25	1862	Between Læsø and Sæby. 12 fms	57°20′	10°43′	» »	0	♀	27	27	
	» April 26	1856	NE of Skagen's Light. 8 fms	57°45′	10°40′	» »	I	♂	22·5	23	
	» June 4	1851	3 miles S from NW Reef Light. Læsø	57°14′	10°46′	» »	III	♀	27·5	29·5	
	» » 6	1861	Flyndergrund, E of Læsø. 10 fms	57°16′	11°16′	» »	III	♂	24	25·5	
	» » 10	1879	ESE of Sæby. 10 fms	57°15′	10°41′	» »	III	♂	21	23·5	
	» » 12	1864	SE of Frederikshavn's harbour. 11 fms	57°23′	10°41′	» »	III	♀	23	26·5	
	» » 14	1868	The outermost channel between Sæby and Læsø. 10 fms	57°18′	10°44′	» »	III	♂	24	25	
	» » 27	1869	E of Sæby. 9 fms	57°20′	10°40′	» »	III	♂	25	26	
	» » 27	1870	SE of Sæby. 9 fms	57°17′	10°40′	» »	III	♀	22	25	
	» » 27	1871	SSE of Frederikshavn's harbour. 11 fms	57°23′	10°41′	» »	III	♀	23·5	26·5	
	» » 27	1873	At Skagen. 3 fms	57°44′	10°39′	» »	III	♀	26·5	28·5	
	» » 27	1876	SE of Sæby. 9 fms	57°17′	10°39′	» »	III	♀	25·5		
	» July 10	1865	SE of Læsø. 10 fms	57°6′	11°25′	» »	IV	♂	23	26	
	» » 20	1859	2 miles SW from Skagen	57°42′	10°37′	Swedish S. B.	IV	♀	25·5	29	
	» » 22	1857	At Nordre Rønner. W of Trindelen	57°24′	10°57′	» »	IV	♀	22·5	27·5	
	» » 22	1878	At Nordre Rønner. W of Trindelen	57°24′	10°57′	» »	IV	♀	24·5	28	
	» » 23	1877	12 miles E by N from Hirsholmene. 17 fms	57°34′	10°58′	Danish S. B.	IV	♀	24	28·5	
	» 24	1860	SE of Frederikshavn's harbour. 12 fms	57°23′	10°43′	» »	IV	♂	24·5	26·5	
	» 27	1852	NW Reef. Læsø. 11 fms	57°18′	10°46′	» »	IV	♀	24	27	
	Sept. 3	1872	8 miles NW from Anholt	56°49′	11°27′	» »	VI	♀	24	30	fish dry
	1905 July 24	1866	E of Sæby. 11 fms	57°21′	10°43′	» »	XVI	♀	22	25	fish fresh

Tabel 6. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery									
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1904. March 7. 8½ miles NE of Hirsholmene, Herthas Flak. 57°35 N 10°48′ E. 29 meters. "Thor" St. 207. 20 plaice liberated (No. 1881—1900). "Thor"s marking experiment No.4 1904.	1904 March 10	1897	3 miles NE from Hirsholmene. 12 fms	57°32′	10°40′	Danish S. B.	0	♀	25·5	25·5	
	» » 10	1899	3 miles NE from Hirsholmene. 12 fms	57°32′	10°40′	» »	0	♀	23·5	23·5	
	» » 14	1889	2 miles ENE from Hirsholmene. 15 fms	57°30′	10°40′	» »	0	♀	26	26	
	» » 14	1891	6 miles SSE from Skagen's Light. 13 fms	57°39′	10°44′	» »	0	♂	27·5	27	
	» » 15	1886	NE of Skagen's Light. 20 fms.	57°46′	10°41′	» »	0	♂	29	27·5	fish dry
	» » 18	1881	N of Skagen's Light. 15 fms	57°46′	10°37′	» »	0	♀	32·5	31	fish dry
	» » 21	1892	8 miles E from Hirsholmene. 15 fms	57°34′	10°50′	» »	0	♀	32	32	
	» » 23	1884	SE brush-buoy, Skagen. 6 fms	57°44′	10°41′	» »	0	♀	28·5	28	
	» » 23	1895	S of the old church, Skagen. 8 fms	57°40′	10°35′	» »	0	♂	28	27·5	
	» » 31	1894	7 miles S from Læsø			Swedish S. B.	0	♂	21	[25]	
	» April 12	1887	2 miles N from Hirsholmene. 13 fms	57°31′	10°38′	Danish S. B.	I	♂	28	28·5	
	» » 12	1898	6 miles N from Hirsholmene. 13 fms	57°35′	10°40′	» »	I	♂	22·5	23	
	» » 16	1896	Off Aalbæk. 5 fms	57°36′	10°30′	» »	I	♀	24·5	23·5	
	» July 29	1885	8 miles E from Hirsholmene. 18 fms	57°31′	10°52′	» »	IV	♂	24·5	30·5	
	» August 5	1888	Nordre Rønner, Læsø, bearing SSE. 14 fms	57°28′	11°3′	» »	V	♂	28	31	
1904. March 14. Kattegat. Aalbæk Bay off Aalbæk. 57°35½′N 10°33′E. 12 meters. "Thor" St. 216. 40 plaice liberated (No. 1901 — 1940). "Thor"s marking experiment No. 5 1904	1904 March 19	1938	E of Aalbæk. 5 fms	57°36′	10°31′	Danish S. B.	0	♂	27	27	
	» » 22	1915	E of Aalbæk. 5½ fms	57°36′	10°32′	» »	0	♀	27·5	28	
	» » 23	1920	1 mile E from Aalbæk. 5 fms	57°36′	10°31′	» »	0	♀	26·5	26·5	
	» » 23	1936	½ mile E from Bunken. Aalbæk Bay			» »	0	♂	24	24	
	» » 25	1909	SE brush-buoy at Skagen. 6 fms	57°44′	10°41′	» »	0	♂	26	25·5	
	» » 30	1905	Off the old church of Skagen. 12 fms	57°43′	10°44′	» »	0	♀	26	25·5	
	» April 4	1929	NE of Aalbæk. 6 fms	57°38′	10°34′	» »	I	♀	27·5	[24]	
	» » 4	1930	NE of Aalbæk. 6 fms	57°38′	10°34′	» »	I	♀	25·5	25·5	
	» » 4	1937	NE of Aalbæk. 6 fms	57°38′	10°34′	» »	I	♀	25·5	25·5	
	» » 8	1923	Off Hulsig. 2 miles dist. 4 fms	57°38′	10°32′	» »	I	♂	26·5	27	
	» » 8	1924	Off Hulsig. 2 miles dist. 4 fms	57°38′	10°32′	» »	I	♀	28	27·5	
	» » 11	1912	At Trindelen. 12 fms	57°29′	11°15′	Swedish S. B.	I	♀	26.5	26·5	
	» » 11	1922	Off Aalbæk. 5 fms	57°36′	10°30′	Danish S. B.	I	♀	24·5	24	
	» » 12	1904	E of the old church, Skagen. 7 fms	57°42′	10°37′	» »	I	♀	25	26	
	» » 12	1908	E of the old church, Skagen. 7 fms	57°42′	10°37′	» »	I	♂	29	29	
	» » 12	1910	Off Aalbæk. 5 fms	57°36′	10°30′	» »	I	♀	22		
	» » 12	1913	Off the old church of Skagen. 6 fms	57°42′	10°35′	» »	I	♀	27	27·5	
	» » 12	1931	Off Aalbæk. 5 fms	57°36′	10°30′	» »	I	♂	23·5	24	
	» » 12	1935	Off Aalbæk. 5 fms	57°36′	10°30′	» »	I	♀	25	25	
	» » 12	1939	At Røsen, E of Læsø	57°20′	11°15′	Swedish S. B.	I	♀	27·5	27·5	
	» » 16	1916	Off Aalbæk. 5½ fms	57°35′	10°32′	Danish S. B.	I	♀	24·5	23·5	
	» » 23	1902	Off Hulsig, 3 miles from shore	57°38′	10°34′	» »	I	♀	25	25	
	» » 24	1925	SE of Aalbæk. 5 fms	57°34′	10°28′	» »	I	♀	25·5	25·5	
	» » 26	1901	E of Skagen. 7 fms	57°42′	10°37′	» »	I	♂	30·5	31	
	» » 26	1907	S of Skagen's church			» »	I	♀	31	31	
	» May 10	1928				» »	II	♀	24	25	
	» » 11	1914	Between Aalbæk and Skagen. 3 fms	57°40′	10°31′	» »	II	♀	24	25·5	
	» » 11	1921	Off Aalbæk. 6 fms	57°36′	10°32′	» »	II	♀	25	26	
	» June 1	1911	S of Skagen. 7 fms	57°41′	10°35′	» »	III	♂	25·5	26·5	
	» » 1	1934	3 miles SE of Skagen. 13 fms	57°42′	10°43′	» »	III	♂	27·5	29·5	
	» » 4	1932	S of the old church of Skagen. 7 fms	57°41′	10°35′	» »	III	♀	25·5	27	
	» » 4	1933	E of Skagen's Light. 12 fms	57°45′	10°43′	» »	III	♂	24·5	26·5	
	» » 23	1917	Skagen's Light bearing NNE. 8 fms	57°43′	10°38′	» »	III	♀	27	[26]	
	» » 29	1906	SSW of Skagen			Swedish S. B.	III	♂	27	27	
	» July 22	1919	Hertha's Flak	57°39′	10°52′	» »	IV	♂	26	29	
	» » 28	1927	S of the old church of Skagen. 5 fms	57°41′	10°33′	Danish S. B.	IV	♀	25	27·5	
	» October 14	1903	SW of Skagen's L. V. 5 fms	57°45′	10°42′	» »	VII	♂	22	28	

Fig. 2. Transplantation experiments with plaice. February, 1904. Exper. 1, 2, 3, 4, 8, 9. The dark spot is the place of capture, the circles are the places of liberation.

C. The transplantation experiments with plaice in 1904.

In spring, 1904, transplantation experiments with 1700 plaice of a length from 18 to 32 cm. were made by the "Thor" in the waters surrounding Denmark. The specimens were marked in the usual way with two bone buttons and a brass disc.

Most of the plaice were captured on the rich rearing grounds at Horns Reef and were transplanted partly into the Graadeep inshore waters, partly into deeper water in the Horns Reef area, and partly into the Skagerak. A smaller number, 60 specimens, were transplanted in the Kattegat from the Aalbœk Bay to Trindelen.

The plaice transported over shorter distances (less than 12 miles) were kept separately on the "Thor"s deck without any supply of sea-water. Those transported over greater distances were placed in wooden tanks in which sea-water was kept in circulation by means of the ship's pump and hose.

A detailed account of the experiments will be found in the Tables 10 and 11.

1. The transplantation from the Horns Reef Grounds to the Graadeep inshore waters (the experiments No. 1, 8 and 9, Fig. 2).

In the experiments No. 1, 8 and 9 in February of 1904, 140 plaice were transplanted from the waters west of Graadeep to the Graadeep inshore waters, a distance of 7—12 miles. The black spot on Fig. 2 indicates the place where the specimens were caught.

The intention with these experiments was to elucidate if the fish would remain in the inshore waters during the summer till the autumn fishing took place, or if they would migrate to offshore grounds before that time.

The experiments have proved that the fish quickly began to migrate towards the offshore grounds. The tendency to migrate outward was so strong that not a single one of the transplanted fish was recovered in the inshore waters during the intense autumn fishing; thus it must be supposed that practically all disappeared from the inshore waters in the course of the spring and summer.

Table 7. Rate of Growth of Plaice transplanted from W. of Graadeep to the Graadeep inshore waters. February, 1904. (Exp. No. 1, 8 & 9).

Date liberated	Month recovered	Period of Growth	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. February 22.—26.	1904 April	2 months	0·5	0	2·5	12	23·3	21	26
	» May	3 »	0·6	0·5	1	5	22·4	21	24
	» June	4 »	1·4	0·5	2·5	4	22·8	22	25
	» July	5 »	3·9	2·5	5·5	4	22·5	22	23
	» August	6 »	5·0	...	...	1	24	..	..
	» Septbr.	7 »	...	...	...	..	...	..	..
	» October	8 »	9·0	...	...	1	23	..	..
	» Novbr.	9 »	4·5	...	...	1	21	.	..
	» Decbr.	10 »	...	...	...	..	...	..	.
	1905 Jan.	11 »	...	...	...	..	...	..	..
	» Febr.	12 »	5·5	...	...	1	21	..	..
	» March	13 »	6·5	...	...	1	23	..	..
	» April	14 »	6·0	...	...	1	20	..	..
	» May	15 »	6·3	3	9·5	2	22	21	23
	» June	16 »	8·3	5·5	11	2	23	22	24
	» July	17 »	7·0	...	...	1	23	..	..
	» August	18 »	9·5	...	...	1	20	..	..

Of the transplanted 140 specimens 31 or 22·1 % were recaught within one year. Until Septbr. 30th of 1906 the total recaptures amounted to 36 specimens or 25·7 %. As more than 40 % of the liberated specimens were on an average recaught in the ordinary marking experiments in the Horns Reef area in the course of one year, these transplantations thus show a considerably lower percentage of recaptures. Still it may hardly be supposed that the fish were injured during the transportation.

On Fig. 2 the places of recapture of the liberated specimens have been put down. Several specimens have migrated far from the place of liberation. One which was recovered in the Kattegat 12 months after liberation had moved more than 200 miles from the place of liberation.

The Table 7 p. 15 shows the increase in growth of the transplanted specimens. It may be noticed that the increase in size in the course of one year is ca. 6 cm. or about the same as has been noticed by the not-transplanted specimens in the Horns Reef area (compare Table 2 p. 9).

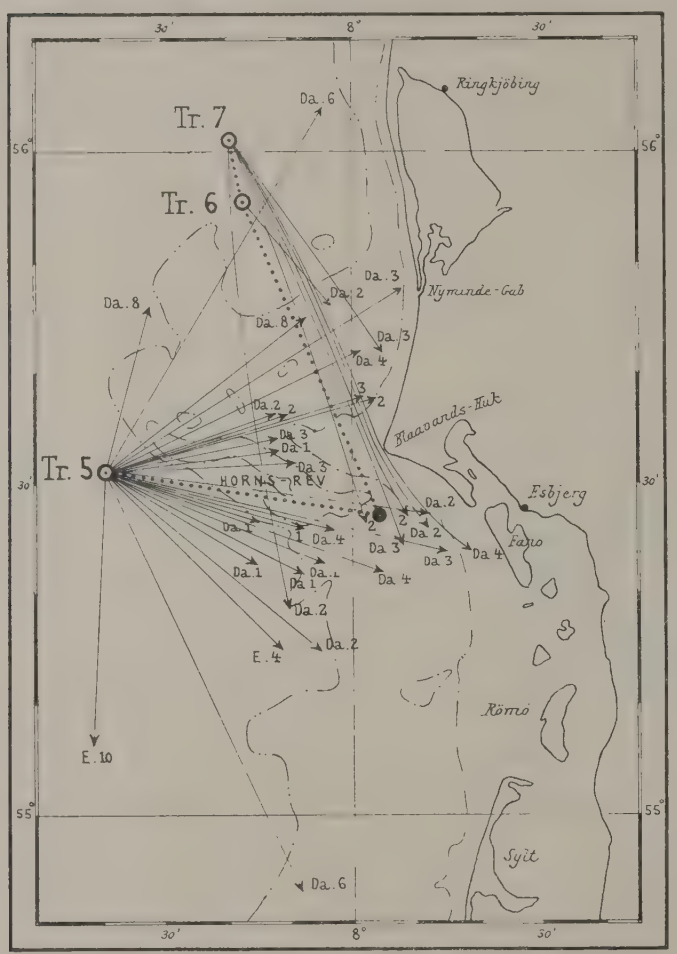

Fig. 3. Transplantation experiments with plaice. February, 1904. Exper. No. 5, 6, 7. The dark spot is the place of capture, the circles are the places of liberation.

2. The transplantation from the Horns Reef coastal-grounds to the Horns Reef off-shore grounds. (Experiments 2, 3, 4, 5, 6 and 7. Fig. 2 and 3.)

In the experiments No. 2, 3, 4, 5, 6 and 7, 900 plaice were transplanted from the waters W. of Graadeep at 55°27′ N. 8°4½′ E. to deeper water in the Horns Reef area. Fig. 2 and 3 represent the places of liberation.

The intention with these experiments was to investigate

1) if the increase in growth of the transplanted specimens was considerably greater than that of the specimens which were marked and liberated in more shallow water,

2) if a considerable percentage of the transplanted specimens would be recaught.

The experiments showed that only a very slight percentage of the transplanted fish, scarcely 5 %, was recovered in the course of one year, also that these specimens did not increase perceptibly quicker in size than those which were marked and liberated in the coastal waters.

The main reason why only such a slight percentage was recaught may probably be looked for in the fact that many specimens had been weakened during the transportation.

The specimens liberated in the 5th experiment 3 miles S. of the Horns Reef lightship at a depth of 31 m. had naturally suffered least, being transported over the shortest distance. In this experiment 13·5 % of the liberated specimens were recaught during one year.

When Fig. 3 seems to indicate that the transplanted specimens have shown a marked tendency to return to the Horns Reef Grounds, this is essentially due to the circumstance that a much more intense plaice-fishery is carried on here than on the off-shore grounds. The specimens migrating in a western direction have had a far greater chance of avoiding recapture than those moving in an eastern or south-eastern direction towards the Horns Reef Grounds. It is, however, a remarkable fact that not a single specimen is known to have migrated in a western direction towards greater depths.

The growth of the transplanted specimens is represented on Table 8. It will be noticed that the increase during one year is ca. 6 cm. which is about the same as in the not-transplanted specimens, which were liberated in more shallow water (compare Table 2 p. 9).

Table 8. Rate of Growth of plaice transplanted from the Graadeep into deeper water in the Horns Reef Area. February, 1904. (Exper. No. 2, 3, 4, 5, 6, 7.)

Date liberated	Month recovered	Period of Growth	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. Febr. 23.—25.	1904 March	1 month	0·2	0	1	11	24·5	21	28
	» April	2 months	0·6	0	1·0	10	26·1	22	31
	» May	3 »	0·9	0	2·0	10	23·9	21	28
	» June	4 »	0·9	0	2·0	5	23·4	22	26
	» August	6 »	3·3	3	3·5	2	27	26	28
	» October	8 »	5·5	5·5	5·5	2	22·5	21	24
	» Novbr.	9 »	6·5	...	...	1	24	..	..
	» Decbr.	10 »	6·0	...	...	1	20	..	..
	1905 August	18 »	10·8	9	12·5	2	26·5	26	27
	» Novbr.	21 »	8·5	...	...	1	24	..	..

3. The Transplantation from the Horns Reef Grounds to the Skagerak. March 1st, 1904. (Transplantation experiment No. 10, 1904. Fig. 4.)

In the transplantation experiment No. 10, which took place on March 1st of 1904, 600 plaice were transplanted from Graadeep to the Jammer Bay in the Skagerak. The intention with this experiment was to obtain information as to whether the specimens transplanted from the Horns Reef area into the Skagerak would increase in size with a considerably greater rapidity than those remaining at the Horns Reef, also if a similar percentage would be recaptured of these transplanted specimens as of those caught, marked and liberated in the Skagerak.

The marking experiments in 1903 showed that the plaice in the Skagerak increased twice as much in size as did the plaice at the Horns Reef, a fact which naturally gave rise to the supposition that it would be of great importance from an economical point of view to undertake on a large scale the transplantation of young plaice from the Horns Reef to the Skagerak. (See Contributions to the Biology of the Plaice I p. 22—23).

The experiments carried on in 1904 have given the results, that only an exceedingly small percentage of the liberated specimens were recovered, and that these recovered specimens certainly increased with nearly twice the rapidity of the marked plaice at the Horns Reef in 1903, but not with a much greater rapidity than the marked plaice at Horns Reef in 1904.

Of the 600 transplanted plaice only 42 specimens or 7·0 % were recovered within one year after liberation, and up to Septbr. 30th of 1906 the total recaptures did not comprise more than 45 specimens or 7·5 %. If we compare how many specimens were recaught in the ordinary marking experiments undertaken on the same areas where the transplanted specimens were liberated, it will be seen that the

small percentage of specimens recovered in the transplantation experiments cannot be due to a small intensity of fishing. It must evidently be ascribed to other causes.

Of the specimens liberated in the ordinary marking experiments in the Skagerak in April of 1903 and March of 1905 in the same area and at the same depth where the transplanted specimens from the Horns Reef were liberated in 1904, the following percentage was recaught in the course of one year:

in the experiments in 1903: 53·1 % (32 liberated 17 recovered)
» » » » 1905: 47·8 % (575 » 275 » »)

Two reasons might be suggested *a priori* to account for the fact that only a very small percentage was recovered in the transplantation experiment. In the first instance we might suppose that the plaice were injured during the transportation and when liberated less able to live than in the ordinary marking experiments. Secondly it might be supposed that the changed conditions of life into which the plaice were transferred might be unfavourable and cause a migration from the place of liberation and eventually to grounds where the fishery was less intense. Probably both these factors have been of consequence, but in my opinion we shall have to look for the main reason for the small percentage of specimens recovered in the circumstance that the plaice became weakened during the transportation.

During the voyage from Graadeep to Skagerak the weather became gradually rougher and on reaching the Skagerak we met with a north easterly gale.

It was quite evident that the plaice had become weakened during the transportation. The strong movement caused by the high sea affected them seriously. They were repeatedly thrown about in the tank and many specimens showed signs of exhaustion. Several specimens died before we reached the place of liberation. My co-workers and helpers (among whom I may mention the sailing master Captain JØRGENSEN, an experienced master of trawlers, and Mr. TARBENSEN, an experienced fisherman from Esbjerg) as well as I myself thought at the time that the specimens which we marked and liberated were capable of living, but considering now how small the percentage is that has been recovered, I feel quite convinced that we must have overrated their vitality. When the plaice are beforehand somewhat weakened they are probably much affected by the irritation caused by the marking and later on by the attached label itself. At present definite specimens are also to hand of marked plaice which have been fished dead from the sea-bottom shortly after liberation. Though these examples do not originate from the transplantation experiments they are still of great interest, proving that plaice marked by experienced people, who believed them to be perfectly well and strong on liberation, have still suffered so much injury by the capture or the process of marking that they have died shortly after.

These examples are as follows:

1) Plaice marked Da. 220 liberated S. of Horns Reef on April 10th, 1903. Male of length 20 cm. Recaptured by an English steam-trawler on April 14th, 1903. GARSTANG records: "Fish not received, but the fisherman says the fish was dead and rotten when caught".

2 and 3) Plaice marked Da. 05, 1386, and Da. 05, 1420 liberated in Aalbœk Bay in North-West Kattegat on March 29th, 1905. Female of length 27 cm., and Male of length 22 cm. Retaken by a Danish cutter on April 5th, 1905. The fisherman said that they were dead and rotten when caught ("døde og bedærvede ved Fangsten"). Mr. LORENTZEN in Frederikshavn, who measured the fish shortly after they were caught, confirmed this statement.

It should be noted that two of the above mentioned plaice were relatively small specimens of 20 and 22 cm. length.

Even if the main reason, why such a proportionately small number of the specimens transplanted into the Skagerak from Horns Reef was recovered, is to be looked for in the fact that the plaice had become injured during the transportation and were partly moribund when set free, there is as said before a possibility that another concurrent cause of the slight number of recaptures may be sought for in the

fact that numbers of liberated specimens have quickly migrated away from the place of liberation and that some arrived at grounds subjected to less intense fishing. It appears, namely, as will be seen from the survey below, that a relatively large percentage of the recovered specimens had left the Skagerak before recapture (see Fig. 4).

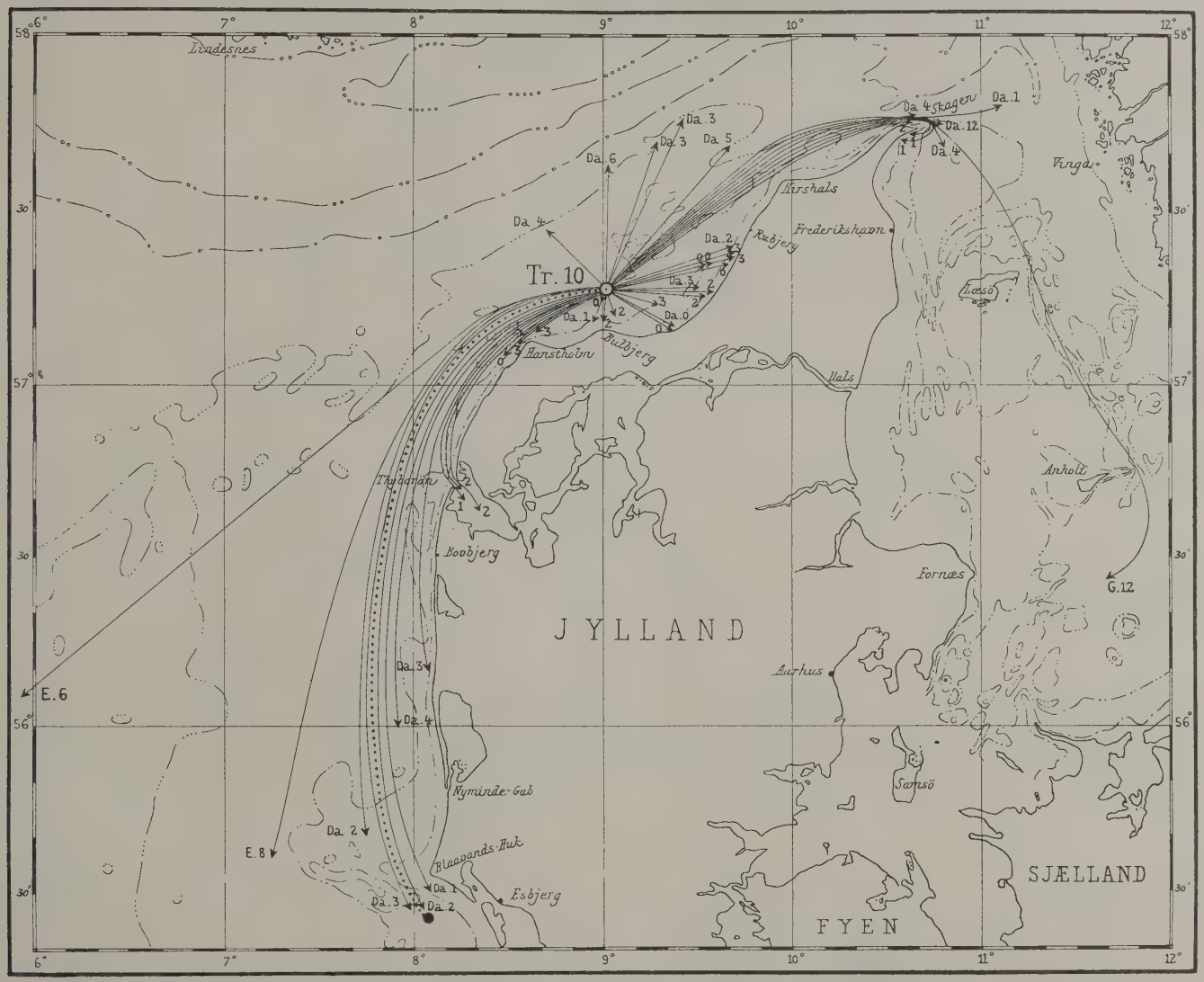

Fig. 4. Transplantation experiments with plaice. March 1st, 1904. Exper. No. 10. The dark spot indicates place of capture, the circle is the place of liberation.

The 45 specimens which were recovered before Septbr. 30th of 1906 from the transplantation experiment in Jammer Bay in the Skagerak on March 1st of 1904, were captured in the following waters:

a) In the Skagerak 26 specimens or 57·8 %
b) » » Kattegat 5 » » 11·1 %
c) » » North Sea 11 » » 24·4 %
d) » » Limfjord 3 » » 6·7 %

The 18 specimens, which were recovered before Septbr. 30th of 1905 in the ordinary marking experiments in Jammer Bay N.E. of Bulbjerg in April, 1903, were caught at the following places:

In the Skagerak 12 specimens or 66·7 %
» » North Sea 6 » » 33·3 %

Two hundred and seventy specimens recovered before Septbr. 30th, 1906, in the ordinary marking experiments in Jammer Bay on March 22nd, 1905, were captured in the following waters:

In the Skagerak 215 specimens or 79·6 %
» » Kattegat 21 » » 7·8 %
» » North Sea 33 » » 12·2 %
» » Limfjord 1 » » 0·4 %

The transplanted specimens thus seem to show a stronger inclination for long wanderings than those marked and set free at the place of capture. It is very probable therefore that a relatively large number from the transplantation experiments have reached the less intensely fished, off-shore grounds, for instance in the North Sea.

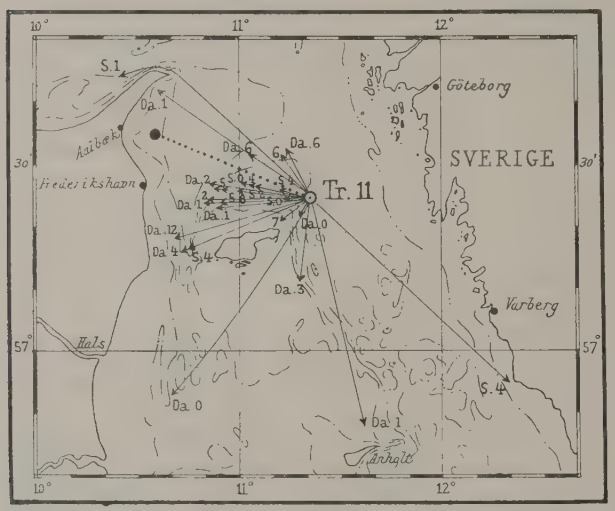

Fig. 5. Transplantation experiments with plaice. March 21st, 1904. Experiment No. 11. The dark spot is the place of capture. The circle is the place of liberation.

A survey over the growth of the specimens transplanted from the Horns Reef to the Skagerak is supplied in Chap. III. The yearly increase seems to be 7—8 cm., which means ca. 1 cm. more than the average increase in the Horns Reef area from spring, 1904— spring, 1905 (see p. 9). It should be remembered, however, that the yearly increase here has been calculated on the base of so few specimens that a wide margin ought to be allowed for individual differences.

4. Transplantation experiments in the northern Kattegat in March and September, 1904.

In an experiment, made on March 21st of 1904, 60 plaice were transplanted from Aalbæk Bay to Trindelen in the northern Kattegat. The specimens were fished at a depth of 15 meters and liberated at a depth of 40 meters.

In the course of one year 34 specimens or 56·7 % of the transplanted fish were recovered, and it appears as if the growth of these specimens has on an average been quicker than of those marked and liberated in Aalbæk Bay (compare Table 4, p. 10, and Table 9, p. 21).

Fig. 5 illustrates the transplantation experiment. Most specimens were recovered at less depths than at the place of liberation: a natural consequence of the fact that the most intense plaice-fishing is carried on in shallow water. Only a single specimen was recaptured near the Swedish coast.

In autumn, 1904, on September 13th, a single transplantation experiment was undertaken with 40 plaice, which were transplanted from Aalbæk Bay to the deeper part of the northern Kattegat (12 miles E. $^3/_4$ S. of Skagens L. V.).

The plaice were fished at 17 meters depth and liberated at 50 m. As none of the transplanted fish have been recovered later, it may be supposed, that they have all died probably on account of the changed conditions of life. That they should have been weakened during transportation over the relatively short distance from the place of capture to the place of liberation is hardly probable.

The transplanted specimens measured 22—28 cm. The place of capture and the place of liberation did not show any particular difference, neither in the water's temperature nor in the salinity. At the place of capture the temperature was 12·40 C. at the bottom and the salinity was 33·8 ‰; at the place of liberation the temperature was 12·90 C., the salinity 34·2 ‰.

Table 9. Rate of Growth of plaice transplanted from Aalbœk Bay to Trindelen in the northern Kattegat. March, 1904. (Transpl. exper. No. 11.)

Date liberated	Month recovered	Period of Growth	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. March 21.	1904 April	1 month	0·5	0	1	4	22·8	22	24
	» May	2 months	1·7	1	2·5	5	23	21	24
	» June	3 »	1·8	1·5	2	2	24	24	24
	» July	4 »	3·5	2	5·5	6	24·3	23	26
	» August	5 »	5·8	5	6·5	3	22·3	22	23
	» Septbr.	6 »	6·0	5·5	6·5	3	22·7	22	24
	» October	7 »	7·0	...	...	1	23	..	..
	» Novbr.	8 »	8·5	...	...	1	22	..	..
	1905 March	12 »	4·5	...	...	1	24	..	..
	1906 February	23 »	8·0	...	...	1	26	..	..

Table 10. Table showing particulars of Liberation and Recapture of plaice in the transplantation experiments, February and March, 1904.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery									
	Date	No. on Label	Locality reported	Central Position (Approximately)	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
				N E						
1904. Febr. 22. Fish liberated between Sæden strand light and Skallingen. 55°29′ N 8°21′ E. 10 meters. 35 plaice transported 12 miles (No. 66—100). "Thor"s transplantation experiment No. 1 1904	1904 April 20	69	½ mile NE of the bell buoy; Graadeep. 5 fms.	55°27′ 8°14′	Danish S. B.	II	♂	24	24	
	» » 23	71	3 miles N by W from Graadeep. 4 fms.	55°29′ 8°13′	» »	II	♂	21·5	21	
	» May 27	83	6 miles SSW from Graadeep. 5 fms.	55°22′ 8°16′	» »	III	♂	21	21·5	
	» July 5	66	6 miles W from Blaabjerg. 12 fms.	55°45′ 8° 4′	» »	V	♀	23	25	
	» Octbr. 10	100	8 miles W by S from Blaabjerg. 9½ fms.	55°42′ 8° 1′	» »	VIII	♀	23	31·5	
	1905 Febr. 17	74	Vinga bearing E by N, Trindelen bear. S by W. 25 fms.	57°38′ 11°16′	German S. S.	XII	♀	21	26	
1904. Febr. 23. Fish liberated 26 miles W from Horns Reef Light-ship. 55°29·N 6°33¼′E 38 meters. 100 plaice transported 52 miles. (No. 201—300). "Thor"s transplantation experiment No. 2 1904	1904 May 16	205	20 miles SSW from Graadeep. 7½ fms.	55°07′ 8°10′	Danish S. B.	III	♀	26	26·5	
	» June 11	276	ESE of Amrum	54°36′ 7°40′	German S. S.	IV	♀	26·5	26	
	1905 Aug. 29	241	Lat. 58°06′ N. Long. 10°07′ E. 60 fms.	58°06′ 10°07′	» S.T.	XVIII	♂	27	39	

Table 10. *Continued*

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery									
	Date	No on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1904. Febr. 23.—24. Fish liber. 32 m. W 1/2 N from Horns Reef L. S. 55°30′N 6°23½′E 40 meters. 100 plaice transported 57 miles. (No. 301—400). "Thor"s transplantation experiment No. 3 1904	1904 March 16	302	Between Helgoland and Weser L. S.	54° 0′	7°55′	German S. S.	I	♂	25	25	
	» » 25	364	Lat. 55°20′ N. Long. 6°20′ E. 21 fms.	55°20′	6°20′	English »	I	♀	24	23·5	Fish salted
	» April 2	387	35 miles NNW from Horns Reef L. S. 13 fms.	56° 3′	6°43′	» »	II	♂	23	23	Fish sound
	» May 15	362	Lat. 54°45′ N. Long. 7°40′ E. 10½ fms.	54°45′	7°40′	» »	III	♂	21	21	» »
	1905 Nov. 30	329	c. Lat. 56°0′ N. Long 4°18′ E. 20 fms.	56° 0′	4°18′	» S. T.	XXI	♀	24·5	32·5*)	*) *fide* fisherman
1904. Febr. 23.—24. Fish liber. 35 miles W 5/8 N from Horns Reef L. S. 55° 31′ N 6° 18′ E 40 m. 40 plaice transtorped 60 miles. (No. 401—440). "Thor"s transplantation experiment No. 4 1904	1904 Febr. 28	415	S side of Dogger Bank. 55°10′ N 4°10′ E.	55°10′	4°10′	English S. S.	0	♀	27	26	Fish sound
	» March 17	412	Lat. 56°5′ N. Long. 7°10′ E. 15 fms.	56° 5′	7°10′	» »	I	♀	27	27	» »
	» » 20	433	Locality unknown			» »	I	♀	28	27·5	» »
1904. Febr. 24. Fish caught 7 miles S by W from Blaavands Point. 55°27′ N 8°4½′ E 14 m. Liberated 3 miles S of Horns Reef L. S. 55° 31′ N 7°21′E 31 meters. 200 plaice transported 25 miles (No. 486—685). "Thor"s transplantation experiment No. 5 1904	1904 March 13	553	1⅓ miles SE from Vyl buoy. 9½ fms.	55°26′	7°52′	Danish S. B.	I	♂	25·5	25	
	» » 20	597	5 miles SE from Vyl L. S. 10 fms.	55°23′	7°56′	» »	I	♀	23	22	
	» » 23	500	8 miles N by E from Vyl L. S. 10 fms.	55°33′	7°48′	» »	I	♂	21·5	21	
	» » 23	552	Lat. 55°27′ N Long. 7°45′ E.	55°27′	7°45′	English S. S.	I	♀	22	22·5	Fish sound
	» » 28	561	2 miles WSW from Vyl L. S. 11 fms.	55°23′	7°45′	Danish S. B.	I	♂	26·5	26	
	» » 28	575	4 miles ESE from Vyl L. S. 9 fms.	55°22′	7°52′	» »	I	♀	26·5	25·5	
	» » 30	613	(Taken from the stomach of a cod)			English S. S.	I	♂	23	22·5	Half albino
	» April 16	639	16 miles SW from Graadeep. 11 fms.	55°15′	7°55′	Danish S. B.	II	♀	22·5	21·5	
	» » 19	498	4 miles N from Blaavands Point. 4½ fms.	55°38′	8° 3′	» »	II	♀	22	[18·5]	
	» » 19	584	1 m. NW from the bell buoy, Graadeep 6½ fms.	55°27′	8°12′	» »	II	♂	24·5	24·5	
	» » 24	630	1 mile NW from Slugen N. 8 fms.	55°36′	7°49′	» »	II	♀	25.5	25·5	
	» » 30	568	1 mile E by N from Slugen N. 8½ fms.	55°36′	7°50′	» »	II	♂	25	25	
	» May 6	586	1 mile NW from Munk buoy. 10 fms.	55°32′	7°51′	» »	III	♂	21·5	21·5	
	» » 7	499	2 miles SW from Slugen N. 11 fms.	55°34′	7°48′	» »	III	♂	21	20·5	
	» » 7	629	Off Fanø			German S. S.	III	♂	27	27	
	» » 14	627	2 miles S from Graadeep. 6 fms.	55°24′	8°15′	Danish S. B.	III	♂	25	25·5	
	» » 24	664	2 miles SW from Nymindegab. 7 fms.	55°48′	8° 8′	» »	III	♂	23	23·5	
	» » 25	635	3 miles NW from Ringebjerge Bn. 6 fms.	55°38′	8° 2′	» »	III	♀	21·5	22	
	» June 6	523	4 miles SW from Cancer. 8 fms.	55°26′	7°57′	» »	IV	♂	25	[23·5]	
	» » 6	634	10 miles WSW from Graadeep. 8 fms.	55°22′	8° 5′	» »	IV	♂	23	23	
	» » 9	638	5 miles W from Kærgaarde Bn. 7½ fms.	55°42′	8° 1′	» »	IV	♀	23	23	
	» » 14	601	10 miles S from Vyl L. S. 13 fms.	55°15′	7°49′	English S. S.	IV	♀	22	23·5	Fish sound
	» August 3	620	16 miles W from Red Cliff.	54°53′	7°52′	Danish S. B.	VI	♀	26	29	
	» 19	558	6 miles W from Klegod Bn. 12 fms.	56° 4′	7°56′	» »	VI	♀	28·5	31	
	» October 14	571	10 miles NNE from Slugen N. 8 fms.	55°45′	7°53′	» »	VIII	♀	24	29	
	» » 31	489	16 miles NNW from Slugen N. 14 fms.	55°46′	7°28′	» »	VIII	♂	21	26	
	» Dcbr. 26	626	Lat. 55°6½′ N Long. 7°19′ E. 13 fms.	55°6½′	7°19′	English S. S.	X	♂	20·5	26	Tail dry
	1905 August 3	679	20 miles NNW of Slugen N. 13 fms.	55°52′	7°25′	Danish S. B.	XVIII	♂	26	34·5	

Table 10. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery									
	Date	No. on Label	Locality reported	Central Position (Approximately) N E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1904. Febr. 25. Fish liber. 15 miles W ¼ S from Aargab Bn. 55°55½′N7°43′E 27 meters. 250 plaice transported 31 miles (No. 685—935). "Thor"'s transplantation experiment No. 6 1904	1904 April 22	905	1 mile NW from Kærgaarde. [10 fms.]		Danish S. B.	II	♀	31·5	32	Tail dry and curled
	» Nov.	692			English S. S.	IX	♂	24·5	30·5	
1904. Febr. 25. Fish liber. 15 miles W by S from Søndervig. 56°1′ N 7°41′ E 30 meters. 210 plaice transported 36 miles (No. 936—1145). "Thor"'s transplantation experiment No. 7 1904	1904 April 21	973	3 miles NW from the bell buoy, Graadeep 7 fms.	55°27′ 8° 9′	Danish S. B.	II	♂	29·5	29	
	» » 28	1044	12 miles SW from Cancer. 9 fms.	55°19′ 7°50′	» »	II	♂	24·5	25	
	» » 28	1131	2 miles S from Cancer. 7 fms.	55°27′ 8° 2′	» »	II	♀	29	29	
	» » 30	1048	1 mile NW from the bell buoy, Graadeep 7 fms.	55°26′ 8°12′	» »	II	♀	29·5	30	
	» May 24	1055	2 miles SW from Kærgaarde. 6½ fms.	55°42′ 8° 5′	» »	III	♂	26·5	27·5	
	» » 30	1059	7 miles WSW from Graadeep. 8 fms.	55°25′ 8° 8′	» »	III	♀	28	29·5	
	» June 2	1042	4 miles SW by S from Fanø sea bath 3½ fms.	55°24′ 8°19′	» »	IV	♀	23	24	
1904. Febr. 26. Fish caught 9 miles W by S ½ S from Skallingen's Light. 55°25¼′ N 8°4¼′ E 15 meters. Liberated on the Graadeep Barre. 55°26′ N 8°16′ E 7 meters. 40 plaice transported 7 miles (No. 1146—1185) "Thor"'s transplantation experiment No. 8 1904	1904 April 20	1158	1 mile W from the Graadeep bell buoy. 6 fms.	55°26′ 8°12′	Danish S. B.	II	♀	23·5	23	
	» » 20	1180	½ m. NE from the Graadeep bell buoy. 5 fms.	55°27′ 8°14′	» »	II	♂	26·5	27	
	» » 23	1165	½ mile SW from Cancer. 6½ fms.	55°28′ 8° 2′	» »	II	♀	25·5	25	
	» » 26	1148	6 miles N from Slugen N. 6 fms.	55°41′ 7°47′	» »	II	♂	22	21·5	
	» June 9	1155	5 miles W from Kærgaarde. 7½ fms.	55°42′ 8° 2′	» »	IV	♂	22	23	
	» » 12	1154	Horns Reef L. S. bearing SW distant 15 m. 9 fms.	55°47′ 7°35′	English S. S.	IV	♀	22	22·5	Fish sound
	» » 13	1160	5 miles W by N from Blaabjerg. 9½ fms.	55°45′ 8° 5′	Danish S. B.	IV	♂	25	25	
	» July 14	1184	SW of Bovbjerg. 12 fms.	56°24′ 7°58′	» »	V	♀	23	26	
	» Novbr. 17	1149	Lat. 55°50′ N Long 7°20′ E	55°50′ 7°20′	German S. S.	IX	♂	21	25	
	1905 April 4	1183	Lat. 55°2′ N Long 7°35′ E	55° 2′ 7°35′	» »	XIV	♀	20·5	26	
	» May 29	1163	3 miles NW from Kærgaarde Bn. [9 fms.]		Danish S. B.	XV	♀	23	32	
	» June 18	1169	12 miles WSW from Graadeep. 10 fms.	55°16′ 8° 0′	» »	XVI	♀	24	29	
	» July 26	1156	NNE of Horns Reef L. V. 14 fms.	55°44′ 7°24′	» »	XVII	♂	23	30	Fish fresh
	» Aug. 2	1178	Lat. 55°18′ N. Long 4°20′ E. 20 fms.	55°18′ 4°20′	English S. T.	XVIII	♀	20·5	28	Salted and dried
1904. Febr. 26. Fish caught 9 miles W by S ½ S from Skallingen's Light. 55°25¼′ N 8°4¼′ E 15 meters. Liberated between Sædenstrand Light and Skallingen. 55°28½′ N 8 20½′ E 14 m. 65 plaice transported 10 miles (No. 1186—1250). "Thor"'s transplantation experiment No. 9 1904	1904 April 21	1226	6 miles S from Blaavands Point. 4 fms.	55°29′ 8° 8′	Danish S. B.	II	♀	24	24	
	» » 23	1195	½ mile SW from Cancer. 6½ fms.	55°28′ 8° 2′	» »	II	♀	23	22·5	
	» » 28	1215	2 miles S from Cancer. 7 fms.	55°27′ 8° 3′	» »	II	♂	25 5	26	
	» » 30	1202	¾ mile S from Cancer. 8 fms.	55°28′ 8° 3′	» »	II	♀	21·5	21·5	
	» » 30	1206	1 m. WNW from the Graadeep bell buoy. 7¼ fms.	55°26′ 8°12′	» »	II	♀	22·5	24·5	
	» » 30	1240	2 m. N from the Graadeep bell buoy. 5 fms.	55°28′ 8°13′	» »	II	♂	24·5	24	
	» May 6	1187	3 miles WNW from Graadeep. 8 fms.	55°26′ 8° 9′	» »	III	♂	23	23	
	» » 6	1236	6 miles SW from Graadeep. 8 fms.	55°25′ 8°11′	» »	III	♀	23	23	
	» » 9	1224	1 mile W from the Graadeep bell buoy. 7 fms.	55°26′ 8°12′	» »	III	♀	24	24	
	» » 31	1218	1 mile SE from Vyl buoy. 9 fms.	55°26′ 7°52′	English S. S.	III	♂	21	21	Fish sound
	» June 2	1204	2 miles W from Fanø sea bath. 2 fms.	55°25′ 8°19′	Danish S. B.	IV	♂	22·5	24·5	
	» » 12	1214	7 miles W by S from Graadeep. 8 fms.	55°25′ 8° 7′	» »	IV	♂	23	[22]	
	» » 23	1203	35 miles below Horns Reef. 15 fms.	55° 0′ 7°25′	English S. S.	IV	♂	22		
	» July 26	1245	16 miles NW from Ringkøbing Bn. 15 fms.	56°13′ 7°42′	Danish S. B.	V	♂	22·5	26	
	» » 29	1233	Lat. c. 56° N Long. c. 7°50′ E	56° 0′ 7°50′	Dutch S. S.	V	♂	22·5	27·5	
	» August 4	1220	270 miles ENE of Spurn. 27 fms.	56°18′ 6°25′	English »	VI	♀	24·5	29	Fish sound
	1905 March 3	1235	Lat. 53°50′ N Long. 5°10′ E. 17 fms.	53°50′ 5°10′	» »	XIII	♂	23·5	29·5	Fish sound
	» May 27	1209	6½ miles NNW from Graadeep. 6 fms.	55°29′ 8° 7′	German »	XV	♀	21·5	23·5	Salted and dried
	» June 6	1234	Lat. 55°43′ N. Long. 7°40′ E. 12 fms.	55°43 7°40′	English S. T.	XVI	♂	22	32·5	

Table 10. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately)	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
				N E						
1904. March 1. Fish caught 9 miles W by S ½ S from Skallingen's Light. 55°25½' N 8°4½' E 15 meters. Liberated in Jammer Bay, Skagerak. 57°12'—57°21' N 8°45'—9°17' E c. 14 meters. 600 plaice transported ca. 125 miles. (No. 1251 1850). "Thor"s transplantation experiment (No. 10 1904	1904 March 20	1823	1½ mile N of Bulbjerg. 10 fms.	57°15' 9° 0'	Danish S. B.	0	♀	26	26	
	» » 21	1787	Slettestrand. Jammer Bay	57°10' 9°22'	» »	0	♀	20·5		
	» » 22	1788	1 mile S from Løkken. 4 fms.	57°21' 9°39'	» »	0	♀	25 5		
	» » 29	1781	N of Klitmøller Bn. 2 m. from shore. 10 fms.	57° 5' 8°29'	» »	0	♀	21	19·5	Fish dry
	» » 29	1582	½ mile W from Slettestrand	57° 9' 9°22'	» »	0	♀	21·5	22	
	» » 30	1819	1 mile S from Løkken. 4 fms.	57°21' 9°39'	» »	0	♂	22	22	
	» » 30	1678	1 mile S from Løkken. 4 fms.	57°21' 9°39'	» »	0	♀	28	28	
	» April 14	1609	S of Skagen's church. 3 fms.	57°43'10°35'	» »	I	♀	25	25	
	» » 18	1266	S of Skagen's Light. 5 fms.	57°43½'10°38½'	» »	I	♂	24	24	
	» » 19	1253	Off Hanstholm Light. 9 fms.	57° 8' 8°33'	» »	I	♂	26·5	26	
	» » 19	1262	Off Marstrand, 16 miles from shore. 25 fms.	57°48'11° 6'	» »	I	♂	24·5	24·5	
	» » 23	1328	1mile NE from Bragerne, Jammer Bay. 10fms.	57°11' 8°57'	» »	I	♀	26	26	
	» » 29	1720	3 miles S by W from Blaavands Point. 4 fms.	55°30' 8° 5'	» »	I	♀	25	25	
	» » 30	1821	Nissum Bredning S from the Fjordground	56°40' 8°16'	» »	I	♀	25·5	25·5	
	» May 5	1400	Tyborøn Canal	56°42' 8°15'	» »	II	♀	23	23	
	» » 7	1762	N from Skagen's Light. 8 fms.	57°45½'10°38'	» »	II	♀	23·5	23	
	» » 8	1346	Off Bulbjerg. 3 miles from shore. 6 fms.	57°12' 9° 4'	» »	II	♀	28	28	
	» » 10	1573	2 miles NE from Bulbjerg. 8 fms.	57°11' 9° 0'	» »	II	♀	26·5	25	
	» » 13	1621	Nissum Bredning	56°38' 8°21'	» »	II	♂	25·5		
	» » 21	1442	1 mile NW from Løkken. 10 fms.	57°24' 9°41'	» »	II	♂	26	26·5	
	» » 26	1483	6 miles NE from Slugen N	55°40' 7°45'	» »	II	♀	26·5	27	
	» » 26	1276	2 miles S from Cancer. 7 fms.	55°27' 8° 3'	» »	II	♀	25·5	27	
	» » 28	1325	Off Blokhus. 1 mile from shore. 4 fms.	57°16' 9°33'	» »	II	♀	27·5	27·5	
	» » 28	1771	Off Blokhus. 1 mile from shore. 4 fms.	57°16' 9°34'	» »	II	♂	24·5	25·5	
	» June 1	1414	N of Svinkleven. 6 fms.	57°14' 9°17'	» »	III	♂	26·5	26	
	» » 1	1318	S of Løkken. 1 mile from shore. 3 fms.	57°22' 9°41'	» »	III	♂	25	26	
	» » 1	1439	Off Husby Klit. 4 fms.	56°10' 8° 5'	» »	III	♂	26	28·5	
	» » 7	1522	1 mile NW from Løkken. 6 fms.	57°23' 9°41'	» »	III	♀	24	26	
	» » 9	1735	3 miles SW from Cancer. 8 fms.	55°27' 7°59'	» »	III	♀	26	27	
	» » 10	1836	W of Hanstholm. 1 mile from shore. 8 fms.	57° 7' 8°33'	» »	III	♀	27	28	
	» » 11	1715	Off Blokhus. 3 miles distant	57°17' 9°30'	» »	III	♀	27	28	
	» » 12	1730	1 mile NE from Hanstholm. 7½ fms.	57° 9' 8°38'	» »	III	♀	24·5	26·5	
	» » 30	1619	NW of Hirshals. 32 miles from shore. 25 fms.	57°46' 9°25'	» »	III	♂	25	27	
	» » 30	1798	NW of Hirshals. 18—24 fms.	57°42' 9°17'	» »	III	♂	23·5	26·5	
	» July 15	1722	NE of Hanstholm. 20 fms.	57°27' 8°42'	» »	IV	♂	27	32	
	» » 22	1727	N of Skagen's Light. 25 fms.	57°46' 10°38'	» »	IV	♂	24	28·5	
	» » 27	1454	12 miles SW from Husby Klit. 12 fms.	56° 0' 7°55'	» »	IV	♀	25	31	
	» » 29	1814	SE of Skagen. 14 fms.	57°41' 10°48'	» »	IV	♀	21	24·5	
	» August 1	1708	NE of Hirshals. 12 miles dist. 20 fms.	57°41' 9°40'	» »	V	♀	26	30·5	
	» Septbr. 4	1805	NW of Løkken. 30 fms.	57°38' 9° 2'	» »	VI	♂	22·5	27	
	» » 11	1699	250 miles ENE from Spurn. 25 fms.	56°5' 5°55'	English S. S.	VI	♀	26·5	29·5	Tail dry
	» Novbr. 17	1329	Lat. 55°46' N Long. 7°15' E. 14 fms.	55°46' 7°15'	» »	VIII	♂	25	30·5	Sound
	1905 March 12	1578	18 miles S by W from Anholt	56°26' 11°40'	German »	XII	♂	27·5	33	
	» » 23	1413	East of Skagen. 15 fms.	57°45' 10°46'	Danish S. B.	XII	♀	22·5	31·5	
	1906 Sept. 25	1589	Lat. 57°05' N. Long. 7°15' E. 19 fms.	57°05' 7°15'	English S. T.	XXX	♀	21		
1904. March 21. Fish caught in Aalbæk Bay 57°35' N 10°35½' E. Depth 15 meters. "Thor" St. 227. Liberated at Trindelen 57°25' N 11°21' E. Depth 40 meters. 60 plaice transported 27 miles.	1904 March 23	1965	Nordre Rønner Light bearing SSW. 10 fms.	57°27' 11° 2'	Swedish S. B.	0	♂	24		
	» » 23	1977	½ mile S from Trindelen. 18 fms.	57°25' 11°15'	» »	0	♂	22	22	
	» » 30	1980	SE of Hals. 6 fms.	56°53' 10°39'	Danish »	0	♂	24	23·5	
	» » 30	1956	4 miles S from Trindelen. 15 fms.	57°22' 11°18'	» »	0	♂	24	23·5	
	» April 5	1954	NW of Nordre Rønner, Læsø. 15 fms.	57°24' 10°50'	» »	I	♀	24·5	24	
	» » 12	1976	S of Skagen. 6 fms.	57°42' 10°36'	» »	I	♀	22	22	
	» » 12	1999	7 miles W. of Skagen. 15 fms. [?]	57°44' 10°25'	Swedish »	I	♀	23·5	24	
	» » 14	1990	4 miles N from Anholt Light	56°48' 11°37'	Danish »	I	♂	22·5		
	» » 18	1958	2 miles NW from Nordre Rønner. 6 fms.	57°23' 10°53'	» »	I	♂	22·5	22·5	
	» May 2	1975	N of Læsø		» »	II	♀	21·5	22	

Table 10. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery								
	Date	No. on Label	Locality reported	Central Position (Approximately) N E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
(No. 1941—2000). „Thor"s transplantation experiment No. 11 1904	1904 May 5	1989	NE of Nordre Rønner, Læsø	57°27′ 11° 3′	Swedish S. B.	II	♂	21·5	[25]	
	» » 10	1964	6 miles N from Nordre Rønner. Læsø	57°27′ 10°52′	Danish »	II	♀	24·5	25	
	» » 25	1994	At Trindelen. 20 fms.		Swedish »	II	♂	22·5	24	
	» » 27	1983	N of Læsø. 10 fms.	57°27′ 11° 2′	» »	II	♀	24	26	
	» » 28	1946	NW of Nordre Rønner, Læsø. 10 fms.	57°24′ 10°51′	Danish »	II	♀	24·5	26	
	» June 4	1985	At Kobberground	57°11′ 11°18′	» »	III	♂	24	25·5	Tail dry
	» » 25	1942	3 miles N from Læsø. 8 fms.		» »	III	♀	24	25	
	» July 3	1957	Læsø Rende	57°16′ 10°43′	» »	IV	♀	23·5	27	
	» » 5	1992	NE of Nordre Rønner, Læsø	57°27′ 11° 3′	Swedish »	IV	♂	24·5	[22]	
	» » 7	1971	S of Trindelen		» »	IV	♀	22 5		
	» » 11	1986	12 miles N from Læsø		» »	IV	♀	24	27	
	» » 12	1951	1 mile W from Morup Light	56°55′ 12°20′	» »	IV	♂	24	27	
	» » 13	1984	At Trindelen	57°26′ 11°14′	» »	IV	♂	26·5	28·5	
	» » 22	1979	Læsø Rende	57°16′ 10°43′	» »	IV	♂	23	24·5	
	» » 29	1941	Læsø Rende?		» »	IV	♀	26	31	
	» August 19	1993	N of Nordre Rønner, Læsø. 5 fms.	57°24′ 10°55′	Danish S. B.	V	♀	22	28	
	» » 23	1943	N of Nordre Rønner, Læsø. 16 fms.	57°26′ 10°53′	» »	V	♀	23	28·5	
	» » 25	1988	N of Nordre Rønner, Læsø. 11 fms.	57°26′ 10°54′	» »	V	♀	22	26·5	
	» Septbr. 7	1953	N of Trindelen. 22 fms.	57°32′ 11°14′	» »	VI	♀	22·5	28	
	» » 8	1987	5 miles NW from Trindelen	57°31′ 11°13′	» »	VI	♀	22·5	27·5	
	» » 28	1996	NW of Trindelen. 22 fms.	57°31′ 11° 3′	» »	VI	♂	24·5	30·5	
	» October 21	1973	Rusmands Bank, Læsø	57°21′ 11°12′	» »	VII	♀	23	29·5	
	» Novbr. 24	1950	NE of Nordre Rønner, Læsø. 5 fms.	57°26′ 11° 0′	» »	VIII	♀	22	30	
	1905 March 3	1960	ESE of Sæby. 10 fms.	57°18′ 10°41′	» »	XII	♂	24	28	
	1906 Febr. 5	1955	N of Skagen. 12 fms.	57°46′ 10°34′	» Fishingb.	XXIII	♂	26	33·5	

Table 11. Table showing the size of plaice at liberation and the specimens of the various sizes that have been recovered until September 30th, 1906. The transplantation experiments in the spring of 1904.

	Graadeep inshore-waters								S. of Horns Reef L. V.				Btw. Horns Reef a. Dogger Bank				Off Ringkøbing Fjord, W. of Jutl.				Skagerak				Northern Kattegat			
	Transpl. exper. No. 1 & 9				Transpl. exper. No 8				Transpl. exper. No. 5				Transpl. exper. No. 2, 3 & 4				Transpl. exper. Nr. 6 & 7				Transpl. exper. No. 10				Transpl. exper. No. 11			
	♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀	
	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.
18 cm.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19 »	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	4	..	4	..	..	..	..	..
20 »	5	..	10	..	..	..	5	2	12	1	14	..	9	..	8	..	2	..	4	..	30	..	32	1	..	..	..	..
21 »	10	3	16	3	4	1	2	..	23	4	25	1	17	1	20	..	30	..	26	..	78	..	73	4	2	1	3	1
22 »	18	5	6	1	3	2	4	1	16	..	25	4	22	..	14	..	37	..	20	..	56	2	55	1	5	4	8	7
23 »	7	3	10	4	1	1	9	3	13	3	13	2	14	1	24	..	33	..	27	1	41	1	38	2	6	1	7	4
24 »	3	2	7	3	..	..	4	1	11	1	13	1	14	..	20	2	27	2	30	..	29	4	27	2	9	8	10	6
25 »	2	1	2	..	2	1	1	1	10	4	8	1	13	1	12	..	26	..	22	..	13	4	34	6	2	..	2	..
26 »	.	..	..	..	2	1	3	..	7	2	4	2	8	..	15	2	23	1	27	..	17	4	29	7	2	2	4	1
27 »	..	..	..	..	..	..	..	..	2	1	1	..	9	1	9	2	23	..	21	..	12	2	14	3	..	..	..	..
28 »	..	..	2	..	..	..	..	..	..	..	1	1	3	..	8	1	15	..	22	1	1	..	8	2	..	..	..	..
29 »	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	14	1	14	2	1	..	3	..	..	..	..	..
30 »	..	..	..	..	..	..	..	..	..	..	.	..	..	..	..	..	2	..	9	..	..	..	..	..	..	..	..	..
31 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	4	1	..	..	..	..	..	..	..	..
32 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..
Total...	46	14	54	11	12	6	28	8	95	16	105	12	109	4	131	7	233	4	227	5	283	17	317	28	26	16	34	19

D. The ordinary marking experiments with plaice in the Kattegat in the autumn of 1904.

In the ordinary Danish marking experiments in October, 1904, 360 marked plaice were set free at 9 different places in the Kattegat. The length of the specimens varied between 18—46 cm.; only one specimen was under 20 cm. and only 5 specimens 40 cm. or above.

Particulars regarding the experiments are represented on the Tables 12 and 13. The entries include all recaptures recorded up to the end of September, 1906, and thus comprise a period of ca. 2 years.

In the course of the first year after liberation 184 specimens or 51·1 % were recaptured, and until September 30th, 1906, the total recaptures amounted to 201 specimens or 55·8 %. Of the specimens between 18—24 cm. the same percentage was recovered as of the specimens between 25—46 cm.

As might be expected the experiments have given the result that the specimens liberated in the northern Kattegat increased considerably more rapidly than those liberated in the southern Kattegat. The former have increased ca. 6 cm. during one year, the latter only ca. 4 cm. (see Chap. III). It should here be remembered that the specimens liberated in the southern Kattegat were for the greater part mature and of a rather considerable size, while the majority of those liberated in the northern Kattegat were immature and of a somewhat smaller size.

Besides the marking experiments mentioned in Table 12, 5 marked plaice were liberated 32 miles SSW.¼W., of Horns Reef light-ship at 45 meters depth on September 28th, 1904. The size of the specimens was as follows: one male: 39 cm., and 4 females: 35, 50, 56 and 57 cm. None of these large specimens are so far known to have been recaught.

A further account of the results of the marking experiments in the Kattegat in October, 1904, may be looked for in Chap. III of the present paper.

Table 12. Table showing particulars of Liberation and Recapture of plaice in the ordinary marking experiments in the Kattegat, October, 1904.

Particulars of Liberation. Date. Locality. No of Fish etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1904. October 5. 11 miles WNW. from Vinga Light. 57°39′ N. 11°16′ E. 44 meters. "Thor" St. 266. 72 Plaice liberated (Da. 4 No. 1—72). Marking experiment No. 6 1904.	1904 Octbr. 16	19	S of Trindelen. 18 fms.	57°25′	11°15′	Danish S. B.	0	♂	30	30	
	» » 22	52	12 miles E of Hirsholmene. 15 fms.	57°35′	10°55′	» »	0	♂	30	30	
	» Novbr. 1	28	NW of Trindelen. 18 fms.	57°29′	11°07′	» »	I	♀	26·5	26	mature
	» » 1	35	NW of Trindelen. 18 fms.	57°29′	11°07′	» »	I	♀	34	34·5	
	» » 7	58	8 miles E of Hirsholmene. 14 fms.	57°35′	10°49′	» »	I	♀	34	33·5	
	» » 16	38	6 miles E of Hirsholmene. 14 fms.	57°30′	10°45′	» »	I	♂	28·5	29	
	» » 16	69	6 miles E of Hirsholmene. 14 fms.	57°30′	10°45′	» »	I	♂	24·5	24	
	» » 25	56	Læsøgrunden NE of Nordre Rønner. 5 fms.	57°23′	10°58′	» »	I	♀	29·5	30	
	» Decbr. 3	4	NE of Hirsholmene. 14½ fms.	57°33′	10°42′	» »	II	♂	32	32	
	» » 4	30	NE of Læsø. 7 fms.			» »	II	♀	28	29	
	» » 4	62	NE of Hirsholmene. 12 fms.	57°31′	10°40′	» »	II	♂	26·5	27	
	13	15	1 mile W of Gl. Skagen. 5 fms.	57°44′	10°30′	» Fishingb.	II	♂	33·5	34	fresh
	» 13	57	The Kattegat.			» S. B.	II	♀	33	34	
	» 14	47	NE of Hirsholmene. 12 fms.	57°31′	10°40′	» »	II	♀	26·5	27·5	
	14	63	NE of Hirsholmene. 12 fms.	57°31′	10°40′	» »	II	♀	32	33	
	19	53	12 miles E of Hirsholmene. 14 fms.	57°36′	10°52′	» »	II	♀	31·5	31·5	
	20	48	2 miles E of Hirsholmene.	57°30′	10°41′	» »	II	♀	27·5	27·5	
	» » 22	67	S of Skagen's Light. 9 fms.	57°43′	10°39′	» Fishingb.	II	♂	29·5	29	
	1905 Jan. 8	43	(Landed in Frederikshavn.)			» S. B.	III	♀	27	28	
	» 21	51	E of Hirsholmene. 14 fms.	57°30′	10°43′	» »	III	♀	30·5	33	

Table 12. Continued.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery									
	Date	No. on Label	Locality reported	Central Position (Approximately) N E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1904. October 5. 11 miles WNW from Vinga Light. 57°39′ N. 11°16′ E. 44 meters. "Thor" St. 266. 72 Plaice liberated (Da. 4 No. 1—72), Marking experiment No. 6 1904.	1905 Jan. 24	18	Off Læsø. 10—12 fms.		Danish S. B.	III	♀	30·5	30·5	
	» » 27	65	N of Skagen.	57°45′ 10°36′	» Fishingb.	III	♂	27·5	27	dry
	» » 28	39	N of Hirsholmene. 14 fms.	57°33′ 10°40′	» S. B.	III	♀	27	28·5	
	» » 30	26	4 miles S by E of Skagen	57°41′ 10°42′	German S. T.	III	♀	31·5	32	
	» Febr. 27	3	4 miles WNW from Vinga. 28 fms.	57°39′ 11°30′	Swedish »	IV	♀	24	23·5	
	» March 3	61	SE of Skagen Light-ship. 13 fms.	57°46′ 10°44′	Danish S. B.	V	♂	26	26·5	
	» » 5	45	N of Læsø. 14 fms.	57°28′ 11°02′	» »	V	♀	35·5	36	
	» » 9	33	Hertha's Flak. 18 fms.	57°40′ 10°59′	» S. T.	V	♀	27·5	29	
	» » 24	22	NE of Nordre Rønner Light Læsø. 9 fms.	57°27′ 11°02′	» S. B.	V	♀	22·5	23·5	
	» » 24	64	NE of Nordre Rønner Light Læsø. 14 fms.	57°28′ 11°04′	» »	V	♀	26	26	
	» April 5	20			German S. T.	VI	♀	30·5	30	
	» » 10	50	Skagen's Light bearing N by E. 5 fms.	57°43′ 10°38′	Dan. Fishingb.	VI	♀	32	32	
	» May 3	31	E of Skagen. 17 fms.	57°45′ 10°45′	» S. B.	VII	♀	25·5	28	
	» » 10	13	SE of Skagen. 14 fms.	57°41′ 10°46′	» »	VII	♂	28	30·5	
	» » 25	41	Rusmandsbanken by Læsø. 5 fms.	57°22′ 11°11′	» »	VII	♂	28	31·5	
	» » 29	21	Flyndergrunden E of Læsø. 20 fms.	57°16′ 11°18′	» »	VII	♂	32	34	
	» June 7	7	Lille Middelgrund.	56°57′ 11°56′	Swedish S. B.	VIII	♂	25	26·5	
	» » 10	49	SE of Kobbergrunden Light-ship. 22 fms.	57°08′ 11°25′	Danish »	VIII	♀	30	33·5	
	» » 21	11	S of Skagen. 5 fms.	57°43′ 10°39′	» Fishingb	VIII	♂	26	29·5	fresh
	» » 25	9	E of Læsø. 14 fms.	57°20′ 11°16′	» S. B.	VIII	♀	25	28	mature
	» July 15	25	S of Skagen's Light-ship. 15 fms.	57°46′ 10°44′	» »	IX	♀	29	32	fresh
	» » 21	2	Lille Middelgrund.	56°57′ 11°56′	Swedish »	IX	♀	31	35	
	» » 24	16	Off Kobbergrundens brush-buoy. 20 fms.	57°12′ 11°21′	Danish »	IX	♀	25	28·5	
	» October 12	17	SE of Hirsholmene. 13 fms.	57°28′ 10°41′	» »	XII	♀	22	28·5	
1904. October 11. 2½ miles SSW from Trindelen. 57°24′ N. 11°15′ E. 34 meters. "Thor" St. 278. 19 Plaice liberated (Da. 4 No. 73—91). Marking experiment No. 7 1904.	1904 Octbr. 16	88	NE of Læsø. 5 fms.		Danish S. B.	0	♂	28	26	
	» » 28	87	Rusmandsbanken Læsø. 4 fms.	57°21′ 11°11′	» »	0	♂	31	32	
	» Decbr. 10	77	NNE of Nordre Rønner Læsø. 10 fms.	57°26′ 10°57′	» »	II	♀	29	29	
	» » 17	84	NE of Læsø. 12 fms.		» »	II	♀	35	36·5	
	1905 Jan. 15	83	NE of Nordre Rønner Læsø. 9 fms.	57°27′ 11°02′	» »	III	♂	28	28·5	
	» May 16	76	N of Nordre Rønner Læsø. 10 fms.	57°25′ 10°54′	» »	VII	♀	28	30	
	» Sept. 6	90	NE of Læsø at Tællemand brush-buoy. 19 fms.	57°21′ 11°17′	» »	XI	♂	26	32·5	
	» October 7	91	Måsesker bearing ESE. 15 miles distant.	58°09′ 10°52′	German S. T.	XII	♀	31	35	
1904. October 12. 8 miles NW by N from Trindelen. 57°32′ N. 11°6′ E. 42 meters. "Thor" St. 280. 43 Plaice liberated. (Da. 4 No. 92—134). Marking experiment No. 8 1904.	1904 Octbr. 23	108	N of Nordre Rønner Læsø. 5 fms.	57°24′ 10°55′	Danish S. B.	0	♀	28	28	
	» » 28	112	NE of Nordre Rønner Læsø. 5½ fms.	57°26′ 11°01′	» »	0	♀	32	32	
	» Novbr. 14	95	8 miles NE of Nordre Rønner. 10 fms.	57°27′ 11°06′	» »	I	♂	29	30·5	
	» » 16	128	8 miles NE of Hirsholmene. 13 fms.	57°36′ 10°46′	» »	I	♀	31	31	
	» » 18	134	NE of Nordre Rønner. 8 fms.	57°26′ 11°02′	» »	I	♂	23	23	
	» » 25	125	N of Nordre Rønner. 6 fms.	57°24′ 10°55′	» »	I	♀	29·5	29·5	
	» » 25	100	SW of Læsø Rende's Light-ship. 5 fms.	57°11′ 10°38′	» »	I	♀	33	34	
	» Decbr. 3	127	NE of Nordre Rønner Læsø. 9 fms.	57°27′ 11°02′	» »	II	♀	34	36	
	» » 10	132	12 miles NE of Hirsholmene. 14 fms.	57°37′ 10°52′	» »	II	♀	27·5	29	
	» » 14	124	NE of Nordre Rønner Læsø. 14 fms.	57°28′ 11°03′	» »	II	♀	36	37	
	» » 19	113	N of Læsø. 9 fms.	57°27′ 11°05′	» »	II	♀	31·5	32·5	
	1905 Jan. 15	130	NE of Nordre Rønner Læsø. 9 fms.	57°27′ 11°02′	» »	III	♂	29	30·5	
	» » 16	99	N of Skagen. 10 fms.	57°46′ 10°37′	» »	III	♂	32	34	
	» » 28	133	The slope W. of Trindelen's Light-ship. 10 fms.	57°25′ 11°13′	» »	III	♂	28·5	28·5	
	» Febr. 23	129	NW by N of Nordre Rønner. 12 fms.	57°24′ 10°51′	» »	IV	♂	29	29·5	
	» March 18	121	N of Skagen. 7 fms.	57°45′ 10°36′	» Fishingb.	V	♀	32	33	
	» April 7	116	S of Hirsholmene. 13 fms.	57°28′ 10°40′	» »	VI	♀	27·5	[26]	
	» » 22	104	Brush-buoy Jessen's Grund. Kattegat.	56°15′ 10°51′	» S. B.	VI	♀	23	24	mature
	» May 5	101	4 miles E of Skagen. 22 fms.	57°45′ 10°48′	» »	VII	♀	33	34	
	» » 29	106	South-west point of Anholt. 14 fms.	56°35′ 11°28′	» »	VII	♂	26·5	29	

Table 12. Continued.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery									
	Date	No. on Label	Locality reported	Central Position (Approximately)	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
				N E						
	1905 June 7	96	E of Sæby. 10 fms.	57°21′ 10°42′	Danish S.B.	VIII	♂	28·5	31	
	» » 17	122	NW of Hirshals. E of the reef. 24 fms.	57°41′ 9°40′	» »	VIII	♂	32·5	37	
	» » 24	111	57°52′ N. 10°38′ E.	57°52′ 10°38′	German S.T.	VIII	♂	29	29	
	» July 11	92	N of Læsø. 8 fms.		Swedish S.B.	IX	♀	21·5	25·5	
1904. October 17. 2 miles E of Aalbæk. 57°36′ N. 10°28′ E 7 meters. "Thor" St. 288. 26 Plaice liberated (Da. 4 No. 175—200) Marking experiment No. 9 1904.	1904 Octbr. 28	176	Off Aalbæk. 4½ fms.	57°36′ 10°29′	Danish S.B.	0	♀	22·5	22	
	» » 28	186	Off Aalbæk. 3 fms.	57°36′ 10°27′	» »	0	♀	24·5	24·5	
	» » 28	190	Off Aalbæk. 3 fms.	57°36′ 10°27′	» »	0	♀	23·5	23	
	» Novbr. 2	175	Off Aalbæk. 5 fms.	57°36′ 10°30′	» Fishingb.	I	♂	22	23	
	» » 5	187	S of Aalbæk. 5 fms.	57°34′ 10°28′	» S.B.	I	♂	25	25	
	» » 12	180	E of Hulsig. 8 fms.	57°40′ 10°35′	» »	I	♀	25	25	
	» » 12	184	E of Hulsig. 9 fms.	57°40′ 10°37′	» »	I	♀	27	27 5	
	» » 16	193	E of Aalbæk. 6 fms.	57°36′ 10°32′	» »	I	♀	24	24·5	
	» Decbr. 20	177	Off Aalbæk. 7 fms.	57°36′ 10°33′	» »	II	♀	22·5	23	
	1905 Jan. 14	191	SSW of Skagen's old church. 8 fms.	57°40′ 10°35′	» Fishingb.	III	♂	24	25	
	» » 20	182	Aalbæk Bay. 6 fms.		» »	III	♀	23·5	26·5	
	» Febr. 16	195	E of Aalbæk. 7 fms.	57°36′ 10°33′	» »	IV	♂	23·5	24	
	» » 20	194	SE of Skagen's old church. 8 fms.	57°41′ 10°37′	» »	IV	♀	24·5	27·5	
	» » 20	199	E of Aalbæk. 7 fms.	57°36′ 10°33′	» »	IV	♀	22·5	23·5	
	» March 22	183	E of Jerup (Aalbæk Bay). 7 fms.	57°33′ 10°34′	» »	V	♀	24	26	
	» May 1	198	6 miles NE of Hirshals.	57°40′ 10°03′	» S.B.	VII	♀	23	25·5	
	» » 2	179	The Aalbæk Bay.		» Fishingb.	VII	♀	20	23	
	» » 2	188	The Aalbæk Bay. 8 fms.		» »	VII	♂	24 5	27·5	
	» » 24	185	2 miles S of Frederikshavn. 5 fms.	57°24′ 10°34′	» S.B.	VII	♂	25	25·5	
	» » 27	192	S of Skagen's old church. 5 fms.		» Fishingb.	VII	♂	23 5	25·5	fresh
	» June 8	189	S of Skagen. 8 fms.	57°44′ 10°38′	» »	VIII	♂	23·5	27	
	» 21	181	S of Skagen. 8 fms.	57°42′ 10°37′	» »	VIII	♀	24	29	
	» » 28	197	S of Skagen, near shore.	57°44′ 10°38′	» »	VIII	♀	24·5	28	
	July 24	200	NW of Skagen's Light. 5 fms.	57°45′ 10°34′	» »	IX	♂	22	28	somewhat dry
1904. October 25. Pakhus Bay, Anholt. 56°40′ N. 11°38′ E. 24—30 meters. "Thor" St 303. 10 Plaice liberated (Da. 4 No. 201—210). Marking experiment No. 10 1904.	1904 Dec. 23	210	Store Middelgrund. 14 fms.	56°38′ 12°03′	Danish S.B.	II	♀	32·5		
	1905 Jan. 10	208	N of Skagen. 10 fms.	57°46′ 10°36′	» Fishingb.	III	♂	37	36	dry
	» March 3	205	4 miles NE of Hirshals.	57°38′ 10°01′	» »	V	♂	34	34	
	» May 10	206	1½ mile NNE of Ostebakken's Light. 2½ fms.	56°44′ 11°35′	» S.B.	VII	♀	30	31	
1904. October 27. 8 miles S. from Anholt Knob. 56°38′ N. 11°54′ E. 32 meters. "Thor" St. 305. 25 Plaice liberated (Da. 4 No. 211—235). Marking experiment No. 11 1904.	1904 Nov. 15	213	N of Store Middelgrund. 13 fms.	56°28′ 12°06′	Danish S.B.	I	♀	39·5	39	
	» Decbr. 16	233	N of Kullen. Store Middelgrund. 13 fms.	56°34′ 12°10′	» »	II	♀	27	28	
	1905 Febr. 20	216	Near Anholt, the Kattegat.		German S. S.	IV	♂	31·5	31	
	» March 15	215	SSW of Anholt, 3 miles distant.	56°41′ 11°38′	Danish S.B.	V	♀	35	34·5	
	» May 15	217	Store Middelgrund. 15 fms.	56°39′ 12°04′	Swedish »	VII	♀	31·5	34	
	» Aug. 22	222	Halmstad Bay. 10 fms.	56°34′ 12°43′	» »	X	♂	29 5	30	
	» Octbr. 27	231	N of Store Middelgrund. 13 fms.	56°39′ 12°06′	Danish »	XII	♀	36·5	41	
1904. October 28. 9 miles SE by S from Kobbergrunden's Light 57°01′ N. 11°34′ E. 24—40 meters "Thor" St. 307. 6 Plaice libe-	1904 Nov. 26	241	SSW of Anholt		Danish S.B.	I	♀	37·5	37	
	1905 July 24	236	N of Anholt. 21 meters.	56°48′ 11°35′	Swedish »	IX	♂	32	36	

Table 12. Continued.

Particulars of Liberation. Date. Locality No. of Fish etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
rated (Da. 4 No. 236—241). Marking experiment No. 12 1904.										
1904 October 28. 6 miles NW from Anholt Knob. L. V. 56°49′N 11°44′E. 30 meters. "Thor" St. 308. 20 Plaice liberated (Da. 4 No 242—261). Marking experiment No 13 1904.	1904 Nov. 16	242	S of Kobberground. 10 fms.	57°08′ 11°23′	Danish S.B.	I	♂	31	31·5	
	1905 March 19	250	12 miles N by W of Anholt. 8 fms.	56°52′ 11°22′	» »	V	♂	39	42*	*fide* fisherman
	» » 20	259	(not reported)		» Fishingb.	V	♀	35	36·5	
	» May 9	252	N of Anholt. 18 meters.	56°47′ 11°34	Swedish S.B.	VII	♂	34·5	35	
	» July 26	251	N of Anholt. 21 fms.	56°48′ 11°35′	» »	IX	♂	32·5	36	
	» Sept. 20	243	NE of Anholt. 17 fms.	56°48′ 11°43′	Danish »	XI	♂	36·5		
	» Nov. 24	244	N of Skagen. 10 fms.	57°46′ 10°36′	» Fishingb.	XIII	♂	32·5	39	fresh
1904. October 29. 10 miles NW by W. of Kullen. 56°21′N. 12°10′E. 32 meters. "Thor" St. 309. 107 Plaice liberated. Marking experiment No. 14 1904.	1904 Nov. 18	319	NNW of Nakkehoved. 13 fms.	56°12′ 12°19′	Danish S.B.	I	♂	32·5	32	tail dry
	» Dec. 7	352	(not reported)		» »	II	♀	35	34	mature
	» » 22	327	55°30′ N. 6°0′ E. 28 fms.	55°30′ 6°0′	German S.S.	II	♀	33·5	32	
	1905 Jan. 26	372	Pakhus Bay. 1 mile from shore. 14 fms.	56°42′ 11°43′	Danish S.B.	III	♀	31·5	31·5	dry
	» Febr. 1	296	South coast of Anholt.		German S.S	IV	♂	30·5	30	
	» » 6	293	N of Isefjord. 8 miles from shore. 10 fms.	56°07′ 11°49′	Dan. Fishingb.	IV	♀	29	30	
	» » 7	299	8 miles NW of Gilleleje. 13 fms.	56°13′ 12°10′	» »	IV	♀	32	32	dry
	» » 10	280	4 miles NW of Nakkehoved. 13 fms.	56°12′ 12°18′	» »	IV	♂	33·5	34·5	
	» » 19	382	Skagen's Light bearing SE. 7 fms.	57°45′ 10°35′	» »	IV	♀	33	32	
	» » 23	292	6 miles S of Sønderbjerg, Anholt. 14 fms.	56°35′ 11°33′	» »	IV	♀	33·5	34	
	» » 24	353	Pakhus Bay by Anholt.	56°42′ 11°38′	» S.B.	IV	♂	27·5	28	
	» » 25	314	N by E of Liseleje. 11 fms.	56°08′ 11°57′	» Fishingb.	IV	♂	28	28*	*fide* fisherman
	» March 4	295	S of Skagen's Light. 6 fms.	57°43′ 10°38′	» »	V	♀	31	31	
	» » 5	281	N of Skagen's Light. 15 fms.	57°46′ 10°37′	» »	V	♂	34	33	
	» » 7	398	Off Hornbæk. 6 fms.	56°06′ 12°28′	» »	V	♀	28	28	
	» » 8	264	N of Liseleje. 8½ fms.	56°06′ 11°56′	» »	V	♂	32·5	32 5	
	» » 14	263	6 miles SSW of Anholt. 14 fms.	56°35′ 11°33′	» »	V	♂	30	30 5	
	» » 16	391	6 miles S of Anholt. 16 fms.	56°37′ 11°40′	» S.B.	V	♀	33	34	
	» » 19	298	6 miles N of Tidsvildeleje. 12 fms.	56°10′ 12°00′	» »	V	♂	32		
	» » 19	365	55°8′ N 5°37½′ E 25 fms.	55°08′ 5°37½′	English S.T.	V	♂	32	33	sound
	» » 20	362	56°10′ N 12°18′ E.	56°10′ 12°18′	Dan. Fishingb.	V	♀	32·5	33	
	» » 20	373	Off Højen Light. 26 fms.	57°46′ 10°33′	» »	V	♀	32	32 5	
	» » 21	380	SE by S of Sønderbjerg, Anholt. 15 fms.	56°39′ 11°37′	» »	V	♀	32	32·5	
	» » 24	271	Anholt Light bearing S ¼ E / Western Highland bearing SSW ¼ W.	56°52′ 11°36′	» S.B.	V	♀	29·5	31*	*fide* fisherman
	» » 30	266	4 miles SW of Morup's Light	56°52′ 12°17′	Sw. Fishingb.	V	♀	33·5	34	
	» » 31	302	Off Svinbådan	56°11′ 12°29′	» »	V	♀	31·5	30	mature
	» April 4	351	NNE off Gilleleje. 8 fms.	56°10′ 12°20′	Danish S.B.	VI	♂	29·5	29	
	» » 5	323	SE of Skagen. 10 fms.	57°43′ 10°41′	» »	VI	♀	32·5	33·5	
	» » 17	350	Gillelejehoved. 2 fms.	56°08′ 12°18′	» Fishingb.	VI	♂	31	31	
	» » 21	363	Off Raageleje (North Sealand). 2½ fms.	56°06′ 12°10′	» »	VI	♀	30·5	31·5	
	» » 22	336	4 miles N of Tidsvildeleje.	56°07′ 12°02′	» »	VI	♂	30	30*	*fide* fisherman
	» May 1	294	Lille Middelgrund. 21 meters.	56°56′ 11°53′	Swedish S.B.	VII	♀	31·5	34	
	» » 3	324	Lille Middelgrund. 12miles from shore. 12 fm.	56°55′ 11°54′	» »	VII	♀	34·5	37	
	» » 4	320	4 miles NNW of Hanstholm.	57°10′ 8°32′	Danish »	VII	♀	32·5	32	
	» » 6	277	1 mile W of Gilleleje. ⅓ fms.	56°08′ 12°17′	» »	VII	♂	30·5	30	
	» » 9	267	3 miles W of Kullen's Light.	56°17′ 12°22′	Swedish »	VII	♂	29	29	
	» » 13	312	6 miles N of Gilbjerg. 13 fms.	56°13′ 12°15′	Danish »	VII	♂	28	28·5	
	» » 13	341	6 miles N of Gilbjerg. 13 fms.	56°13′ 12°15′	» »	VII	♂	30·5	30	
	» » 17	388	4 miles E of Isefjord. 1 mile from shore.	56°02′ 11°57′	» Fishingb.	VII	♀	28·5	30	
	» » 18	347	5 miles W of Kullen's Light. 14—15 fms.	56°17′ 12°19′	Swedish S.B.	VII	♂	31·5	31·5	

Table 12. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery: Date	No. on label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1904. October 29. 10 miles NW by W of Kullen. 56°21′N. 12°10′E. 32 meters. "Thor" St. 309. 107 Plaice liberated. Marking experiment No. 14 1904.	1905 May 25	354	4 miles SE of Grenaa harbour.	56°23′	11°03′	Danish S. B.	VII	♂	31	33	tail a little dry
	31	338				» Fishingb.	VII	♂	29·5	31	
	» June 1	361	6 miles SW from Eftras. 15 fms.	56°45′	12°25′	Swedish »	VIII	♀	31	33	
	14	278	Pakhus Bay by Anholt. 16 fms.	56°41′	11°42′	Danish S. B.	VIII	♀	31·5	33	
	» 29	381	NW of Hirshals. 21 fms.	57°40′	9°44′	» »	VIII	♀	30	34	
	July 5	275	S of Anholt. 8 fms.			» »	IX	♀	29	33	∫immat., tail ⌊ a little dry
	10	397	2 miles SE of SW Point, Anholt.	56°40′	11°35′	» »	IX	♂	28	31	immat. sound
	Sept. 10	273	Tylø Light bearing E by S. 14 fms.	56°39′	12°25′	» »	XI	♀	30·5	34	fresh
	12	304	(not reported)			» »	XI	♂	31·5	[30]	fresh
	13	318	6 miles N of Anholt.	56°50′	11°32′	» »	XI	♂	30	34	tail dry
	29	393	3 miles WNW of Kullen's Light. 13 fms.	56°19′	12°22′	Swedish »	XI	♀	30·5	35·5	
	Octbr. 12	290	4 miles SW of Varberg. 16 fms.	57°04′	12°09′	» »	XII	♀	30	31	
	» 16	384	S of Anholt. 14 fms.	56°41′	11°39′	Danish »	XII	♂	30·5	34·5	
	» Decbr. 6	400	Middelgrunden, SE of Anholt. 14 fms.	56°37′	12°03′	Dan. Fishingb.	XIV	♀	28·5	33·5*	∫* *fide* fisher- ⌊ man
	1906 Jan. 18	389	Skagen's Reef. 20 fms.	57°46′	10°42′	» »	XV	♂	30·5	37	
	» Febr. 24	392	SE of Flyndergrund, Læsø. 17 fms.	57°15′	11°18′	Danish S. B.	XVI	♀	30	35·5	fresh
	March 2	303	Near Anholt.			German S. T.	XVII	♂	26·5	27	
	5	356	N. of Skagen.			Dan. Fishingb.	XVII	♀	32	39·5	sound
	19	385				Danish S. B.	XVII	♀	33		mature
	» April 9	348	PakhusBay, 1 mileS SE of Skejnæshage. 12 fm.			» Fishingb.	XVIII	♀	30	37	fat and solid
	» May 19	378	SE of Anholt. 15 fms.	56°42′	11°45′	» S. B.	XIX	♂	33	36·5	sound
	23	370	Hirshalsrende, N by W of Hirshals. 27 fms.	57°41′	9°52′	» »	XIX	♀	35·5	38·5	
	June 30	340	3½ miles S of Anholt Light. 14 fms.	56°41′	11°40′	» »	XX	♂	32	38	fresh
	Sept. 12	396	56°44′ N. 7°25′ E. 22 fms.	56°44′	7°25′	English S. T.	XXIII	♂	27	36	sound
1904. October 29. 10 miles NW by W of Kullen. 56 21′N. 12°10′E. 82 meters. "Thor" St. 309. 32 plaice liberated, all mature females. Marking experiment No. 14 A 1904.	1905 Febr. 20	379	4 miles N of Gilleleje.	56°12′	12°17′	Sw. Fishingb.	IV	♀	36·5	37	
	» March 8	367	N of Liseleje. 8½ fms.	56°06′	11°56′	Danish »	V	♀	35·5	35*	∫* *fide* fisher- ⌊ man
	9	332	Off Råå, 2 miles distant.	55°59′	12°42′	Swedish »	V	♀	35·5	36	
	18	334	3 miles N of Gilleleje. 10 fms.	56°10′	12°17′	Danish S. B.	V	♀	33·5	33	
	April 6	375	NNE of Spodsbjerg, 6 miles from shore	56°05′	11°45′	» »	VI	♀	31	30	
	» 22	301	Off Gilleleje.			Swedish »	VI	♀	31	30	
	May 9	310	3 miles W of Kullen's Light.	56°17′	12°22′	» »	VII	♀	32	30	
	9	342	3 miles W of Kullen's Light.	56°17′	12°22	» »	VII	♀	33	31	
	13	289	6 miles N of Gilbjerg. 13 fms.	56°13′	12°15′	Danish »	VII	♀	35·5	35·5	
	13	315	N of Nakkehoved. 12 fms.	56°09′	12°21′	» »	VII	♀	31	30	
	24	270	2 miles NW of Kullen's Light.	56°19′	12°24′	Swedish »	VII	♀	30	30	
	June 7	300	2 miles W from Svinbådan.	56°10′	12°27′	» »	VIII	♀	26	28	
	July 5	357	Off Anholt.			Danish »	IX	♀	32	33	tail a little dry
	12	265	Off Kronborg castle. 14 fms.	56°02′	12°38′	» Fishingb.	IX	♀	33	32·5	much shrunk
	Novbr. 22	345	7 miles SW of Kullen's Light. 14½ fms.	56°13′	12°22′	Swedish S. B.	XIII	♀	33·5	35	
	1906 Jan.	339	NNW of Nakkehoved Light. 13 fms.	56°12′	12°19′	Dan. Fishingb.	XV	♀	35·5	37	∫more than ⌊ 5 years
	Febr. 15	284	12 miles SW of Anholt. 14 fms.	56°31′	11°30′	Danish S. B.	XVI	♀	29·5	31·5	

E. The ordinary marking experiments with plaice in the spring of 1905.

In February and March of 1905, 2000 marked plaice were liberated in the waters surrounding Denmark. In the Horns Reef area 345 were liberated, in the Graadeep inshore waters 40, in the Hanstholm-Søndervig area 40, in the Skagerak 775, and in the Kattegat 800 specimens. Particulars regarding the experiments are represented on the Tables 20 and 21.

The list over the captures of the marked fish is here entered up to the end of September, 1906.

Table 13. Table showing the size of plaice at liberation and the specimens of the various size-groups that have been recovered until Septbr. 30., 1906. The marking experiments in the autumn of 1904.

	WNW. of Vinga				SSW. of Trindelen				NW. of Trindelen				Aalbæk Bay				PakhusBay (Anholt)				S. of Anholt Knob				SE. of Kobberground				NW. of Anholt Knob				NNW. of Kullen			
	Marking exper. No. 6				Marking exper. No. 7				Marking exper. No. 8				Marking exper. No. 9				Marking exper. No. 10				Marking exper. No. 11				Marking exper. No. 12				Marking exper. No. 13				Marking exper. No. 14 & 14 A			
	♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀	
	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.
18 cm.	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20 »	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21 »	1	..	1	..	..	..	1	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22 »	2	..	3	2	..	..	..	..	..	..	..	..	2	2	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23 »	..	..	..	..	..	..	1	..	1	1	1	1	4	3	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24 »	3	1	3	1	1	..	..	..	1	..	..	..	2	2	7	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25 »	1	1	4	3	1	..	..	..	..	..	..	..	2	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
26 »	3	3	5	3	1	1	1	..	1	1	3	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1	1	1
27 »	2	1	7	4	1	..	1	..	..	..	3	2	..	..	1	1	..	..	..	..	1	..	1	1	..	..	..	..	..	..	..	..	3	2	..	..
28 »	3	3	2	1	2	2	1	1	3	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	5	3	4	3
29 »	2	1	3	2	..	..	1	1	5	4	1	1	..	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	10	3	9	4
30 »	2	2	6	4	..	..	1	..	1	..	2	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	13	8	12	8
31 »	..	..	4	3	1	1	1	1	1	..	2	2	..	..	..	..	..	..	..	..	1	1	2	1	..	..	..	..	1	1	..	..	6	4	11	9
32 »	2	2	5	2	..	..	..	..	2	2	4	2	..	..	..	..	..	..	2	1	1	..	..	..	1	1	1	..	2	2	1	..	9	5	17	9
33 »	1	1	1	1	..	..	..	..	1	..	4	2	..	..	..	..	..	..	3	..	2	..	1	..	..	..	..	..	..	..	1	..	5	2	12	10
34 »	1	..	2	2	..	..	1	..	..	..	1	1	..	..	..	..	1	1	..	..	2	..	..	..	..	..	..	..	1	1	..	..	1	1	7	1
35 »	..	..	2	1	..	..	1	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	2	1	..	..	..	..	..	..	3	1	..	..	9	6
36 »	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	4	1	..	..	1	..	2	1	2	..	..	..	2	1
37 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	1	..	1	..	1	1	1	..	..	..	..	..	..	..
38 »	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..
39 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	2	1	..	..	..	..	1	..
40 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
41 »	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..
42 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
43 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
44 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
45 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
46 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Total...	23	15	49	29	8	4	11	4	17	10	26	14	10	9	16	15	2	2	8	2	10	2	15	5	2	1	4	1	10	6	10	1	53	29	86	52

The specimens liberated in the Horns Reef area were of a length of 21—30 cm. They were caught by the "Thor" and liberated at three different places, either at the very place of capture or in that neighbourhood. 200 specimens were caught and liberated at St. 381, 55°26′ N. lat. and 8°02′ E. long. at 14 meters depth. 145 specimens were liberated at St. 382 in the North End of Slugen at 55°36′ N. lat. and 7°50′ E. long. and 15 meters depth. Twenty five of these specimens were caught at the same station where they were liberated, while 120 specimens were transported over a distance of 12 miles from the formerly mentioned St. 381. No difference in the frequency of recaptures was perceived.

Of the 345 plaice 232 or 67·2 % were recaptured within one year. 120 specimens were below 25 cm. and gave 59·2 % recaptures, and 225 specimens were 25 cm. or above and gave 71·6 % recaptures within one year.

In the Graadeep inshore-waters, inside the bar between Fanø and Skallingen, 40 marked plaice

of 23—25 cm. were liberated on April 15., 1905. The recaptures in one year amounted to 28 specimens or 70·0 %.

The average increase of the specimens liberated at Horns Reef and Graadeep seems to be ca. 7·5—8 cm. in the course of one year (see Chap. III).

Of the 40 specimens liberated off Torup (near Hanstholm) 35 % were recovered within one year. The specimens measured at liberation 23—32 cm. One specimen, recovered 10 months after liberation, had increased 7 cm. (see Chap. III).

In the Skagerak marking of plaice was undertaken at two different localities.

In the area off Bulbjerg-Svinkleven at 10—16 meters depth, 575 plaice of a length of 22—33 cm. were liberated on March 22nd. They were caught by a Danish snurrevaad's cutter and were all liberated near the place of capture. (Experiment No. 4, 1905).

In the course of the first year after liberation 275 marked specimens or 47·8 % were recovered. Sixteen of the specimens measured at liberation 22—24 cm. and 559 were 25—33 cm. Of the former, 5 specimens or 31·3 %, of the latter, 270 specimens or 48·3 % were recovered in the course of one year.

As shown on Table 14 the average yearly increase of the marked specimens has been ca. 7 à 8 cm.; 8 specimens recovered 8—13 months after liberation had on an average increased 7·6 cm. The individual rapidity in growth was here very different; but the monthly averages were rather consistent for the months April—October. The average size of the marked and recaptured fish was at liberation 26—29 cm.

Table 14. Rate of Growth of plaice liberated in Jammer Bay (Skagerak). March, 1905. Marking experiment No. 4, 1905.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. March 22.	1905 April	1 month	0·3	0	1	36	27·8	23	33
	» May	2 months	0·8	0	2·5	97	28·1	24	31
	» June	3 »	1·6	0	3·5	37	28	25	31
	» July	4 »	3·5	1	7	51	27·6	25	30
	» August	5 »	3·6	1	7	10	27·1	24	30
	» Septbr.	6 »	5·8	4	9	7	27·1	24	29
	October	7 »	6·3	6	6·5	2	29·5	29	30
	November	8 »	8·5	...	...	1	28	..	..
	» December	9 »	12·0	...	...	1	27	..	..
	1906 January	10 »	4·5	...	...	1	26	..	..
	» February	11 »	6	6	6	2	28·5	27	30
	» April	13 »	7·5	6·5	8	3	26 7	25	28

In the Tannis Bay off Spirbakken at 17 meters depth 200 marked plaice measuring from 19—32 cm. were liberated on March 20th, 1905. (Experiment No. 3, 1905). They were all caught by the "Thor" and liberated at the place of capture.

50 specimens were on liberation below 25 cm. and 150 measured 25 cm. or more. Of the former, 7 specimens or 14·0 %, of the latter, 49 specimens or 32·7 % were recovered within 12 months. Of all the liberated plaice 56 specimens or 28 % were recovered in the said time.

As represented on Table 15 the average increase of the specimens during the summer and autumn of 1905 may be estimated at ca. 6 à 7 cm. Two specimens recovered in January, 1906, only showed an increase of 3 and 3·5 cm. in length. The recovered specimens measured on liberation 23—31 cm. and belonged evidently essentially to the III-Group.

Table 15. Rate of Growth of plaice liberated in Tannis Bay (Skagerak). March, 1905. Marking Exper. No. 3, 1905.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. March 20.	1905 April	1 month	0·5	0	2	12	28·5	25	31
	» May	2 months	0·9	0	2·5	28	27·6	23	31
	» June	3 »	2·1	0	4	4	26·5	23	29
	» July	4 »	4·3	3	5·5	2	26	24	28
	» August	5 »	5·0	...	...	1	27	..	..
	» September	6 »	5·0	...	...	1	23	..	..
	» November	8 »	6·5	...	...	1	30	...	..
	1906 January	10 »	3·3	3	3·5	2	28·5	27	30

On March 29th 300 marked plaice of a length of 22—33 cm. were liberated in Aalbæk Bay NW. of Hirsholmene at 16 meters depth. All the specimens were caught by the "Thor" and liberated at the place of capture. They were all, or almost all, immature fish (Exper. No. 6, 1905).

121 of the specimens measured on liberation less than 25 cm. and 179 more than 25 cm. Of the former were recaptured in the course of one year 61 specimens or 50·4 %; of the latter 109 specimens or 60·9 %. Of all the liberated plaice 170 specimens or 56·7 % were recovered in one year.

This percentage is much less than in the marking experiments in 1904 in Aalbæk Bay, where 2 experiments with 40 and 26 specimens gave respectively 92·5 % and 92·3 % of recaptures within one year.

To form a judgment about the normal percentage of recaptures in Aalbæk Bay it is of importance to notice that the experiment of March 29., 1905, was apparently not quite successful. Seven days after liberation 2 marked plaice were hauled up from the sea-bottom by a fisherman, who found them to be "dead and rotten" (see p. 18). Thus it is evident that some of the specimens had sustained injuries either during the process of marking or during the process of capture (by pricks of sea-urchins? A considerable number of *Strongylocentrotus droebachiensis* were taken together with the plaice).

The growth of the liberated specimens appears here to have been rather inconsiderable during the summer. 4 specimens recaptured 7—14 months after liberation had on an average only increased 4·4 cm. On the basis of these few specimens however, we dare not draw the conclusion that the plaice in Aalbæk Bay on the whole increased so slowly in 1905. The investigation of the otoliths does not point in that direction [1].

Table 16. Rate of Growth of plaice liberated in Aalbæk Bay. March, 1905. Marking experiment No. 6, 1905.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. March 29.	1905 April	1 month	0·2	0	1·5	82	26·4	22	33
	» May	2 months	0·8	0	2	48	25·6	22	33
	» June	3 »	1·0	0	3	18	24·8	22	29
	» July	4 »	2·0	0	4·5	9	25	22	29
	» August	5 »	0·7	0	1·5	3	24·3	22	27
	» October	7 »	6·0	..	..	1	23	..	..
	1906 January	10 »	4·0	3·5	4·5	2	29·5	29	30
	» May	14 »	3·5	..	..	1	23	..	..

[1] A. C. Johansen: Ueber die Schollenfischerei im Kattegat und die Mittel, sie zu heben. Rapports et Procès-Verbaux Vol. V. 1906. Conseil perm. internat. pour l'exploration de la Mer. p. 92.

On March 15., 1905, 95 plaice were liberated 5 miles N. of Anholt light at 19 meters depth. One specimen measured 48 cm. and the remaining 26—38 cm. The majority of the specimens were immature fish of the "northern form" (Exper. No. 1, 1905).

Within the first year after liberation 70 specimens or 73·7 % were recaptured.

The growth of the recovered marked fish is represented in Table 17. The monthly averages show a rather regular increase from March, 1905 to January, 1906. The increase amounts in the course of the summer to ca. 5 cm.

Table 17. Rate of Growth of plaice liberated N. of Anholt. March, 1905. Marking experiment No. 1, 1905.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. March 15.	1905 April	1 month	0·3	0	1	10	33·1	26	36
	» May	2 months	1·2	0·5	2·5	17.	33·1	28	37
	» June	3 »	2·3	1·5	3·5	4	32·5	28	36
	July	4 »	2·8	0·5	5	18	32	28	36
	» August	5 »	3·0	...	...	1	36	..	..
	» Septbr.	6 »	4·0	...	...	1	28	..	..
	» Novbr.	8 »	4·8	3	6·5	3	30·3	28	32
	1906 January	10 »	5·3	2·5	8	2	33·5	31	36
	» February	11 »	8·0	...	...	1	33	..	..
	» March	12 »	2·3	2·0	2·5	2	32·5	31	34

In Aalborg Bay at 56°48′ N. lat. 10°35′ E. long. and 9 meters depth, 100 plaice measuring 21—33 cm. were liberated on April 1st, 1905. Most of the specimens were on liberation immature fish of the "northern form" (Exper. No. 7, 1905).

47 of the specimens were below 25 cm., while 53 specimens measured 25 cm. or above. Within one year 19 specimens or 40·4 % were recovered of the former and 28 specimens or 52·8 % of the latter. Of all the 100 specimens 47 % were recovered in the course of one year.

The growth of the recovered specimens is represented in Table 18. It appears from the Table that 10 specimens, which were recovered within 9—14 months after liberation, had on an average increased 6·6 cm.

Table 18. Rate of Growth of plaice liberated in Aalborg Bay. April, 1905. Marking experiment No. 7, 1905.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. April 1.	1905 April	15 days	0	..	..	1	33	..	..
	» May	1 month	2·3	1·5	3	2	22·5	22	23
	» June	2 months	2·1	0·5	4	10	24·9	23	27
	» July	3 »	3·6	2	5	9	25·8	23	29
	» August	4 »	3·3	0·5	6	9	25	23	28
	» Septbr.	5 »	5·7	3·5	7·5	3	25	24	26
	» October	6 »	4·8	3	6	3	26	22	30
	» Novbr.	7 »	2·5	..	..	1	33	..	..
	1906 Jannary	9 »	5·9	4·5	7·5	4	24·3	23	26
	» February	10 »	6·5	6	7	2	24	23	25
	» March	11 »	4·0	..	..	1	23	..	..
	» April	12 »	9·0	8·5	9·5	2	25·5	25	26
	» June	14 »	7·0	..	..	1	22	..	..

Near Anholt, SW. of the isle at 15 meters depth, 305 marked plaice were liberated on March 16th and 17th of 1905. Five specimens were between 21—24 cm., 293 between 25—34 cm. and 7 between 35—43 cm. Most of the specimens were caught by some Danish snurrevaad cutters and liberated near the place of capture. The majority were immature fish of the "northern form" (Exper. No. 2, 1905).

During the first year after liberation 210 specimens or 68·9 % were recovered. The growth of the specimens is represented in Table 19. It will be noticed that 14 specimens of a length of 26—35 cm., recovered 9—15 months after liberation, showed an average increase of 5·5 cm., which must be regarded as a considerable growth for plaice of that size.

Table 19. Rate of Growth of plaice liberated SW. of Anholt. March, 1905. Marking experiment No. 2, 1905.

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. March 16.-17.	1905 April	1 month	0·5	0	2·5	20	29·8	27	32
	» May	2 months	0·8	0	2·0	38	28·2	24	34
	» June	3 »	1·8	0	5·5	13	30·6	26	36
	» July	4 »	2·3	1	4·5	10	28·8	25	33
	» August	5 »	2·2	0	5·5	10	29·3	25	34
	» Septbr.	6 »	2·6	1	4	9	28·9	24	31
	» October	7 »	3·3	0·5	6	6	27·3	25	30
	» Novbr.	8 »	3·2	2·5	3·5	3	29·3	27	32
	» Decbr.	9 »	5·3	1·5	9	4	31·3	28	35
	1906 Febr.	11 »	6·3	4	8·5	2	30	27	33
	» March	12 »	1·8	0·5	3	2	33·5	32	35
	» April	13 »	5·2	2·0	8	3	30	30	30
	» May	14 »	10·0	...	...	1	26	..	..
	» June	15 »	7·0	6	8	2	28·5	28	29
	» July	16 »	7·0	...	...	1	24·5	..	..
	» August	17 »	5·0	...	...	1	28	..	..

Table 20. Table showing particulars of Liberation and Recapture of plaice in the ordinary marking experiments in the Kattegat, Skagerak and North Sea. March and April, 1905.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery									
	Date	No. on Label	Locality reported	Central Position (Approximately)	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
				N E						
1905. March 15.	1904 March 20	14			Danish S. B.	0	♂	26·5	26·5	
5 miles N of Anholt Light, Kattegat. 56°49′ N 11°38′ E. 19 meters. "Thor" St. 341. 95 Plaice liberated (No. 1—95). "Thor"'s marking experiment No. 1 1905	» » 20	24			» »	0	♀	33·5	33·5	
	» » 20	33			» »	0	♀	35	35	
	» » 22	28	S by W of Anholt Light.		» »	0	♂	26	[37]	
	» » 24	16	NE of Anholt. 4 miles from shore. 25 fms.	56°48′ 11°47′	» »	0	♀	33·5	33·5	
	» » 24	19	N of Anholt.		» »	0	♂	33	31	
	» » 27	15	2 miles N from Anholt. 9 fms.	56°45′ 11°37′	» »	0	♀	35·5	35	
	» » 27	76			» Fishingb.	0	♂	32·5	33	mature
	» April 4	51			» »	I	♀	33	32·5	
	» » 4	63	N of Skagen's Light. 5 fms.	57°45′ 10°38′	» S. B.	I	♀	34	33	
	» » 4	87			» Fishingb.	I	♀	26·5	27	
	» » 11	21	1 mile N of Anholt Light. 9 fms.	56°45′ 11°39′	» »	I	♂	33	33	
	» » 11	64	{Anholt Light bearing S by E ½ E. / Western Highland bearing SSW ½ W}	56°49′ 11°35′	» S. B.	I	♀	35	34*	{* *fide* fisherman

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery: Date		Nr. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 15. 5 miles N of Anholt Light, Kattegat. 56°49′ N, 11°38′ E. 19 meters. "Thor" St. 341. 95 Plaice liberated (No. 1—95). "Thor"'s marking experiment No. 1 1905.	1905 April	11	81	Anholt Light bearing S by E 1/2 E / Western Highland bearing SSW 1/2 W	56°49′	11°35′	Dan. Fishingb.	I	♂	36	36	
	» »	11	84	Anholt Light bearing S by E 1/2 E / Western Highland bearing SSW 1/2 W	56°49′	11°35′	» »	I	♂	35	34	
	» »	11	86	Anholt Light bearing S by E 1/2 E / Western Highland bearing SSW 1/2 W	56°49′	11°35′	» »	I	♀	34	34	
	» »	11	91	Anholt Light bearing S by E 1/2 E / Western Highland bearing SSW 1/2 W	56°49′	11°35′	» »	I	♀	32	32	
	» »	15	45	4 miles SSE of Kobbergrunden's L. V. 12 fms.	57°06′	11°27′	» S. B.	I	♂	33	32·5	
	» May	1	88	10 miles NNW by W from Anholt Light. 8 1/2 fms.	56°53′	11°32′	» »	II	♀	31	32	tail dry
	» »	3	4	8 miles NE of Tangens light-buoy.	56°46′	11°07′	» »	II	♀	33	33	tail dry
	» »	5	37	Anholt Light bearing S by E. 4 m. dist. 10 fm.	56°48′	11°36′	» »	II	♀	36	35·5	
	» »	5	46	10 miles NNW of Anholt. 5 fms.	56°52′	11°18′	Swedish »	II	♂	34·5	36	sound
	» »	5	67	7 1/2 miles NW from Anholt. 7 1/2 fms.	56°47′	11°19′	Danish »	II	♂	32	32	
	» »	5	74	10 miles NNW of Anholt.	56°51′	11°20′	Swedish »	II	♀	29	30	sound
	» »	13	2	4 miles N of Anholt Light. 18 meters.	56°48′	11°37′	» »	II	♀	37	38	
	» »	13	8	12 miles S of Kobbergrunden. 8 fms.	56°58′	11°32′	Danish »	II	♀	32	32·5	
	» »	14	35	6 miles NW from Anholt. 6 fms.	56°47′	11°30′	Swedish »	II	♀	36	38	
	» »	15	58	N of Anholt. 10 fms.	56°48′	11°35′	Danish »	II	♂	30	30	
	» »	18	20	3 miles SE of Kobbergrunden's L. V. 8 fms.	57°06′	11°25′	» »	II	♀	33	34·5	
	» »	19	7	12 miles N of Anholt. 14 meters.	56°56′	11°33′	» »	II	♀	34·5	34·5	
	» »	20	17	6 miles NNW from Anholt.	56°49′	11°33′	Swedish »	II	♀	34	35	
	» »	20	83	10 miles N of Anholt.	56°54′	11°33′	Dan. Fishingb.	II	♂	36	36	
	» »	20	92	N of Anholt. 10 fms.	56°48′	11°35′	» S. B.	II	♀	36·5	37·5	
	» »	21	90	10 miles N of Anholt.	56°54′	11°33′	» »	II	♀	32·5	34	fresh
	» »	28	1	9 miles NNW of Anholt Light. 6 fms.	56°52′	11°30′	» »	II	♂	28	28·5	
	» June	1	10	8 miles N from Anholt Light.	56°52′	11°37′	» »	III	♂	37		
	» »	8	39	N of Anholt. 5 miles from shore. 10 fms.	56°50′	11°38′	» »	III	♀	34	35	
	» »	25	61	1 mile N from Anholt Light. 6 fms.	56°45′	11°39′	» »	III	♀	36	37*	*fide* fisherman
	» »	26	52				»Fishingb.	III	♂	28	29·5	dry
	» »	29	48	N of Anholt.			» S. B.	III	♀	32	35	tail dry
	» July	1	49	W of Anholt. 7 1/2 fms.	56°41′	11°20′	» »	IV	♂	32	33	tail dry
	» »	2	70	NW of Anholt. 16 fms.			» »	IV	♀	30·5	35	fresh
	» »	5	42	N of Læsø. 10 fms.	57°27′	11°08′	» »	IV	♂	36	38	tail dry
	» »	8	9	8 miles NNW from Anholt. 9 fms.	56°51′	11°31′	Swedish »	IV	♂	29	29	
	» »	10	25	4 miles S of Kobbergrunden's L. V. 12 fms.	57°05′	11°26′	Danish »	IV	♀	34·5	36·5	dry
	» »	10	47	6 miles N from Anholt Light. 8 fms.	56°50′	11°37′	» »	IV	♂	31·5	34	tail dry
	» »	10	73	9 miles N of Anholt. 9 fms.	56°53′	11°36′	» »	IV	♂	36·5	38	mature, fresh
	» »	10	95	6 miles N from Anholt Light. 8 fms.	56°50′	11°37′	» »	IV	♂	28	30·5	fresh
	» »	11	23	SW of Morup's Light. 20 meters.	56°52′	12°17′	Sw. Fishingb.	IV	♀	35	36	
	» »	12	94	N of Anholt. 24 fms.	56°58′	11°35′	Danish S. B.	IV	♂	33	36	fresh
	» »	17	5	8 miles NNE of Anholt Light. 12 1/2 fms.	56°52′	11°42′	Swedish »	IV	♂	36·5	37	
	» »	17	13	10 miles NE of Anholt. 13 fms.	56°53′	11°50′	» »	IV	♂	33·5	[33]	
		17	71	10 miles NE of Anholt. 13 fms.	56°53′	11°50′	» »	IV	♂	33·5	38	
	» »	22	65	12 miles N of Anholt. 11 fms.	56°56′	11°36′	Danish »	IV	♂	34	36	
	» »	22	85	12 miles N of Anholt. 11 fms.	56°57′	11°35′	» »	IV	♂	29	32	
	» »	26	93	NW of Hirshals.			» »	IV	♀	32	37	fresh
	» »	27	78	N of Anholt. 16 fms.	56°56′	11°37′	»Fishingb.	IV	♀	30	33	fresh
	» »	28	40				» S. B.	IV	♂	30	32	rotten
	» »	28	41	12 miles N of Anholt. 12 fms.	56°56′	11°36′	Swedish »	IV	♀	28	32	
	» August	10	36	NE of Anholt. 22 fms.	56°50′	11°46′	Danish »	V	♂	36	39	living
	» Sept.	5	56	Anholt Light bearing NE. 8 miles from shore.	56°34′	11°26′	» »	VI	♀	28	31	rotten
	» »	10	31	Pakhus Bay. 8 fms.	56°43′	11°37′	» »	VI	♂	33		
	» Nov.	7	59	18 miles E from Skagen. 25 fms.	57°47′	11°12′	Swedish »	VIII	♀	28·5	33	
	» »	10	75	10 miles SW from Varberg. 10 fms.	57°00′	11°59′	» »	VIII	♂	32	38	
	» »	24	27	E of Kobbergrunden's brush-buoy. 8 fms.	57°11′	11°18′	Danish »	VIII	♂	31	34	living

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
	1906 Januar 2	30	211 miles E ½ N from Spurn L. V. 24 fms.	54°49′	5°50′	English S. T.	X	♀	36	38	sound
	» » 23	82	N of Skagen. 20 fms.	57°46′	10°39′	Dan. Fishingb.	X	♀	31	38·5	
	» Febr. 14	80	At Skagen's L. V. 26 fms.	57°46′	10°45′	» »	XI	♀	33	41	fresh
	» March 7	18	Middelgrunden. 13 fms.			» S. B.	XII	♀	31	33	mature, tail dry
	» » 7	26	Middelgrunden. 13 fms.			» »	XII	♀	34·5	36	tail dry
1905. March 16.—17. SW of Anholt, Kattegat. 56°32′-56°39′ N 11°17′-11°36′ E. 15—27 meters. "Thor" St. 344-347. 305 plaice liberated (No. 96-400). "Thor"s marking experiment No. 2 1905.	1904 March 17	187	2 miles S of Anholt. 15 fms.	56°39′	11°37′	Danish S. B.	0	♂	29	29	
	» » 18	210	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♂	29·5	29·5	
	» » 18	232	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♂	28	27	
	» » 18	240	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♂	27·5	27	
	» » 18	244	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♂	26	26	
	» » 18	249	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♀	30	30·5	
	» » 18	250	6 miles S by W of Anholt Bakken. 14 fms.	56°36,	11°33′	» »	0	♀	28	28	
	» » 18	251	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♀	30	30	
	» » 18	255	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♀	27	26·5	
	» » 18	266	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♂	28	28	
	» » 18	276	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♂	31	30·5	
	» » 18	300	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♀	32	31·5	
	» » 18	324	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♂	32·5	32	
	» » 18	329	6 miles S by W of Anholt Bakken. 14 fms.	56°36′	11°33′	» »	0	♀	33·5	33	mature
	» » 19	212	6 miles S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♀	27·5	27	
	» » 19	222	6 miles S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♀	30·5	30	
	» » 19	224	2 miles S of Anholt. 15 fms.	56°39′	11°36′	» »	0	♂	29·5	30	
	» » 19	230	6 miles S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♀	27	26·5	
	» » 19	235	2 miles S of Anholt. 15 fms.	56°39′	11°36′	» »	0	♀	30	30	
	» » 19	238	6 miles S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♀	26·5	26	
	» » 19	253	6 miles S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	30	30	
	» » 19	290	6 miles S or S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	29	29	
	» » 19	328	6 miles S or S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♀	29	29	
	» » 19	355	4 miles S of Anholt. 15 fms.	56°37′	11°35′	» »	0	♂	30	30	
	» » 19	367	2 miles S of Anholt. 15 fms.	56°39′	11°36′	» »	0	♂	29	[30]	
	» » 20	177	16 miles S by W of Anholt Light.	56°28′	11°39′	German S. T.	0	♀	29	27	
	» » 21	163	S of Anholt.			Danish S. B.	0	♂	28		
	» » 21	168	Pakhus Bay, ½ mile from shore.	56°42′	11°37′	» Fishingb.	0	♂	29	28	
	» » 21	171	6 miles SSW of Anholt.	56°36′	11°32′	» S. B.	0	♂	29	29	
	» » 21	172	S of Sønderbjerg, Anholt.			» »	0	♂	31		
	» » 21	179	S of Sønderbjerg, Anholt.			» »	0	♂	27·5		
	» » 21	182	S of Sønderbjerg, Anholt.			» »	0	♀	31·5		
	» » 21	201	S of Sønderbjerg, Anholt.			» »	0	♂	29		
	» » 21	203	S of Sønderbjerg, Anholt.			» »	0	♂	33·5		
	» » 21	270	S of Sønderbjerg, Anholt.			» »	0	♂	28		
	» » 21	272	6 miles S by W of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	28	27	
	» » 21	278	6 miles S or SW of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	26	26	
	» » 21	301	S of Anholt. 4 miles from shore. 16 fms.	56°38′	11°37′	» »	0	♂	28	28·5	
	» » 21	315	S of Sønderbjerg, Anholt.			» »	0	♂	28		
	» » 21	319	6 miles S or SW of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	28·5	28	
	» » 21	325	6 miles S or SW of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	30·5	30	
	» » 21	341	6 miles S or SW of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	29	29	
	» » 21	345	S of Sønderbjerg, Anholt.			» »	0	♀	30·5	30	mature
	» » 21	377	S of Sønderbjerg, Anholt.			» »	0	♀	25		mature
	» » 21	381	6 miles S or SW of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	26·5	26·5	
	» » 22	237	6 miles SSW of Anholt.	56°36′	11°32′	» »	0	♂	30	29	
	» » 22	271	6 miles SSW of Anholt.	56°36′	11°32′	» »	0	♂	29	28	
	» » 22	281	6 miles S or SW of Anholt. 14 fms.	56°36′	11°33′	» »	0	♀	29	29	
	» » 22	285	6 miles S or SW of Anholt. 14 fms.	56°36′	11°33′	» »	0	♂	28·5	28	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 16.-17. SW of Anholt, Kattegat. 56°32'-56°39' N 11°17'-11°36' E. 15-27 meters. "Thor" St. 344-347. 305 plaice liberated (No. 96-400). "Thor"s marking experiment No. 2 1905	1905 March 22	308	6 miles S or SW of Anholt. 14 fms.	56°36'	11°33'	Danish S. B.	0	♂	31	30	
	» » 22	321	Off Anholt.			Dan. Fishingb.	0	♀	32	31	
	» » 22	322	6 miles S or SW of Anholt. 14 fms.	56°36'	11°33'	» S. B.	0	♂	27·5	27	
	» » 22	323	6 miles S or SW of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	26·5	26	mature
	» » 22	346	Off Anholt.			» Fishingb.	0	♀	29	29	
	» » 22	391	6 miles S or SW of Anholt. 14 fms.	56°36'	11°33'	» S. B.	0	♂	30	30	
	» » 24	97	2 miles NNW of Anholt. 8 fms.	56°46'	11°36'	» »	0	♀	31	30	
	» » 24	120	2 miles NNW of Anholt. 8 fms.	56°46'	11°36'	» »	0	♂	27	27	
	» » 24	205	SSW of Anholt.			» »	0	♂	30·5	30	
	» » 24	220	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	29·5	29	
	» » 24	221	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	28·5	28	
	» » 24	269	SSW of Anholt.			» »	0	♂	30	30	
	» » 24	286	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♂	25·5	25·5	
	» » 24	293	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	26·5	26·5	
	» » 24	306	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	29·5	30	
	» » 24	316	SSW of Anholt.			» »	0	♂	30	30	
	» » 24	320	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	26	26	
	» » 24	354	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♂	27	27·5	
	» » 24	370	SSW of Anholt.			» »	0	♂	30·5	30	
	» » 25	282	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♂	30·5	30	
	» » 25	318	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	28·5	28·5	mature
	» » 25	365	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	28	28	
	» » 25	387	2 miles S of Anholt.	56°39'	11°35'	» Fishingb.	0	♀	28·5	29	
	» » 27	223	6 miles SSW of Anholt.	56°36'	11°32'	» S. B.	0	♂	30·5	30·5	
	» » 27	258	6 miles SSW of Anholt.	56°36'	11°32'	» »	0	♂	31	30	
	» » 28	156	8 miles SE of Anholt. 15 fms.	56°39'	11°53'	» »	0	♀	32	32·5	
	» » 28	159	8 miles SE of Anholt. 15 fms.	56°39'	11°53'	» »	0	♀	32	32	
	» » 28	165	8 miles SE of Anholt. 15 fms.	56°39'	11°53'	» »	0	♀	30	31	
	» » 29	216	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♂	31·5	31	
	» » 29	234	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	30	29	
	» » 29	263	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♀	29·5	29	
	» » 29	287	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♂	30	30	
	» » 29	309	6 miles S by W of Ankolt. 14 fms.	56°36'	11°33'	» »	0	♀	29	29	
	» » 29	353	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♂	30·5	30·5	
	» » 29	375	6 miles S by W of Anholt. 14 fms.	56°36'	11°33	» »	0	♀	26	26	mature
	» » 29	392	6 miles S by W of Anholt. 14 fms.	56°36'	11°33'	» »	0	♂	26	26	mature
	» » 31	279	E of Skejnæshage. 10 fms.	56°41'	11°36'	» »	0	♂	30	29	
	» April 1	275	6 miles SSW of Sønderbjerg, Anholt. 12 fms.	56°36'	11°29'	» »	I	♀	30	30	
	» » 1	288	1 mile S of Anholt.	56°40'	11°35'	» Fishingb.	I	♂	29	28	
	» » 1	291	6 miles SSW of Anholt.	56°36'	11°32'	» S. B.	I	♂	29·5	29·5	
	» » 1	298	6 miles SSW of Sønderbjerg, Anholt. 12 fms.	56°36'	11°29'	» »	I	♀	28·5	28·5	
	» » 1	334	6 miles SSW of Sønderbjerg, Anholt. 12 fms.	56°36'	11°29'	» »	I	♂	32	31·5	
	» » 1	363	1/2 mile SSW of Anholt.	56°40'	11°34'	» »	I	♀	27·5	28	
	» » 1	368	1/2 mile SSW of Anholt.	56°40'	11°34'	» »	I	♀	31	30·5	
	» » 2	195	NNE of Anholt.			German S. T.	I	♂	30·5	29	
	» » 4	98	2 miles W of Anholt. 8 fms.			Danish S. B.	I	♀	34·5		mature
	» » 4	207	5 miles S by W of Anholt. 14 fms.	56°37'	11°32'	» »	I	♂	29	28·5	
	» » 4	213	8 miles W of Anholt. 8 fms.	56°41'	11°18'	» »	I	♀	30·5	30·5	
	» » 10	333	6 miles W of Anholt. 14 fms.			» »	I	♂	30	29·5	
	» » 10	337	Pakhus Bay. 15 fms.	56°41'	11°42'	» Fishingb.	I	♀	32·5	32·5	
	» » 11	190	8 miles SSW of Anholt. 14 fms.	56°35'	11°29'	» S. B.	I	♂	30·5	30	
	» » 15	157	Aalborg Bay. E Flak. 12 miles from shore. 7 fm.	57°04'	10°47'	Swedish »	I	♂	30	31	
	» » 17	311	8 miles SW of Anholt. 9 fms.	56°36'	11°26'	» Fishingb.	I	♀	29	30·5	somewh. dry
	» » 19	362	Northern Part of Store Middelgrund. 13 fms.	56°38'	12°04'	Danish »	I	♂	31·5	32	
	» 19	267	S of Skagen's Light. 5 fms.	57°43'	10°39'	» »	I	♂	29·5	27	somewh. dry
	» » 19	283	At Helgenæs.	56°05'	10°31'	» S. B.	I	♂	29·5	28·5	somewh. dry

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 16.-17. SW of Anholt, Kattegat. 56°32'-56°39' N 11°17'-11°36' E. 15-27 meters. "Thor" St. 344-347. 305 plaice liberated (No. 96-400). "Thor"s marking experiment No. 2 1905	1905 April 26	166	6 miles SSW of Anholt.	56°35' 11°32'	Danish S. B.	I	♀	31	31	somewh. dry
	» » 28	374	Off Gerrild Bay.	56°31' 10°57'	» Fishingb.	I	♂	29·5	29·5	mature
	» May 3	132	13 miles NE from Tangen's Light-buoy. 8 fms.	56°50' 11°11'	» S. B.	II	♂	28·5	29	
	» » 3	206	Aalborg Bay. NW of the Light-buoy. 7 fms.	56°46' 10°42'	Swedish »	II	♂	27	27	somewh. dry
	» » 3	274	13 miles NE of Tangen's Light-buoy. 8 fms.	56°50' 11°11'	Danish »	II	♂	28·5	28	
	» » 3	338	13 miles NE of Tangen's Light-buoy. 8 fms.	56°50' 11°11'	» »	II	♀	31	31	
	» » 4	123	Aalborg Bay. 20 miles from shore. 7 fms.		Swedish »	II	♂	24·5	25	
	» » 4	140	Krogøgrund. 15 fms.		Danish »	II	♂	26	26	tail dry
	» » 4	335	N of Skagen's Light. 7 fms.	57°45' 10°38'	» Fishingb.	II	♂	31·5	31	tail dry
	» » 5	101	SE of Hals. 7 fms.	56°54' 10°31'	Swedish S. B.	II	♀	25·5	26	fresh
	» » 5	137	2 miles S from Tangen's Light-buoy.	56°38' 11°00'	Danish »	II	♂	30	30	
	» » 5	148	Aalborg Bay. 16 miles from shore. 7 fms.	56°47' 10°45'	Swedish »	II	♂	25	25·5	
	» » 5	277	Svitringen, SE of Hals. 7 fms.	56°54' 10°31'	» »	II	♂	29	28·5	
	» » 5	310	1/2 mile S of Grenaa Harbour.	56°24' 10°57'	Danish »	II	♂	26	26	
	» » 6	146	4 miles E from Fornæs Light.	56°27' 11°05'	» Fishingb.	II	♂	27·5	28	
	» » 6	397	Off Vinga. 18 fms.	57°37' 11°36'	Swedish S. B.	II	♂	25	24·5	mature
	» » 9	105	3 miles E from Fornæs Light.	56°27' 11°03'	Dan. Fishingb.	II	♂	29	28·5	
	» » 10	399	Aalborg Bay. 20 miles from shore. 7 fms.	56°51' 10°54'	Swedish S. B.	II	♂	27	28	mature
	» » 11	197	20 miles E from Hals. 6 fms.	57°03' 10°55'	» »	II	♀	32	32	
	» » 11	304	16 miles E from Hals. 7 fms.	57°02' 10°49'	» »	II	♀	26·5	27·5	
	» » 14	99	1 mile NE from "Slusen". 4 fms.	56°46' 11°30'	Dan. Fishingb.	II	♀	27·5	26	dry
	» » 17	382	12 miles NE of Staunshoved. 6 fms.	56°43' 10°59'	Swedish S. B.	II	♀	25·5	25·5	mature
	» » 18	117	NW of Anholt. 10 fms.	56°49' 11°11'	Danish »	II	♀	27·5	28	
	» » 18	268	Aalborg Bay, SE of Læsø Rende.		» »	II	♂	29	28	
	» » 19	170	Aalborg Bay. 8 miles NW from the L.-buoy. 5 f.	56°44' 10°50'	Swedish »	II	♂	31	32	
	» » 19	302	Aalborg Bay. NE of the Light-buoy. 8 fms.	56°44' 11°04'	Danish »	II	♂	28·5	28·5	
	» » 20	193	W of Anholt. 10 fms.	56°40' 11°20'	» »	II	♂	25	24·5	
	» » 20	379	W of Anholt. 4 1/2 fms.	56°41' 11°23'	» Fishingb.	II	♂	29·5	31	mature, fresh
	» » 23	106	NW of Anholt. 8 fms.	56°49' 11°17'	» S. B.	II	♀	28	26·5	mature
	» » 24	357	Aalborg Bay. SW of Læsø Rende. 6 fms.	57°11' 10°40'	» Fishingb.	II	♀	29	29·5	
	» » 27	122	4 miles NNE of NW brush-buoy Anholt.	56°53' 11°22'	» S. B.	II	♀	34	34	∫mature, tail \a little dry
	» » 27	181	Pakhus Bay. 4 miles from shore.	56°40' 11°41'	» »	II	♀	28	28·5	fresh
	» » 27	372	3 miles SE of Grenaa Harbour.	56°23' 11°01'	» Fishingb.	II	♂	27	28	∫mature \somewh. dry
	» » 28	160	2 1/2 miles NNE from Ostbakke Light. 4 fms.	56°45' 11°35'	» »	II	♀	31	31·5	a little dry
	» » 28	162	AalborgBay. 10 miles NW of the L.-buoy. 8 fms.	56°45' 10°44'	Swedish S. B.	II	♂	33	34·5	
	» » 28	169	9 miles NNW of Anholt Light. 6 1/4 fms.	56°51' 11°29'	Danish »	II	♀	30	31	
	» » 28	194	Aalborg Bay. 8 miles NW from the L.-buoy.	56°44' 10°47'	Swedish »	II	♀	29·5	31	
	» » 29	348	Anholt Light bearing E by S. 4 miles fr. shore.	56°46' 11°32'	Danish »	II	♂	28	29	somewh. dry
	» » 30	185	Anholt Light bear. E by S. 4 m. fr. shore. 5 fms.	56°46' 11°32'	» Fishingb.	II	♂	30·5	30·5	a little dry
	» » 31	142	8 miles NNW from Tangen's Light-buoy.	56°46' 10°51'	» S. B.	II	♀	28	29	
	» June 4	389	2 miles E of Skejnæshage. 12—13 fms.	56°41' 11°38'	» Fishingb.	III	♀	31	32	∫mature \somewh. dry
	» » 5	330	Off Ebbeløkke, 1 mile from shore.	55°59' 11°30'	» S. B.	III	♂	30		
	» » 6	305	8 miles W from Tangen's buoy.	56°44' 10°47'	» Fishingb.	III	♂	29	29·5	
	» » 7	118			» »	III	♀	31·5	33	
	» » 9	110	NW of Anholt. 7 fms.	56°49' 11°20'	» S. B.	III	♀	36	36·5	
	» » 19	155	2 miles W of Anholt.	56°42' 11°27'	» »	III	♀	34	34	∫mature \tail dry
	» » 21	228	Store Middelgrund. 15 meters.	56°34' 12°05'	Sw. Fishingb.	III	♀	30·5	29	
	» » 27	219	4 miles NW from Tangen's Light-buoy.	56°42' 10°53'	Danish S. B.	III	♀	26·5	30	
	» » 29	126	8 miles N from Grenaa. 7 fms.	56°32' 10°58'	Swedish »	III	♀	34·5	36	
	» » 29	161	5 miles SE of Anholt. 15 fms.	56°37' 11°39'	Danish »	III	♂	29	29	dry
	» » 29	167	N of Anholt.		» »	III	♂	28	28·5	tail dry
	» » 29	200	4 miles WNW of Anholt, 6 fms.	56°44' 11°21'	» »	III	♀	30	31	fresh
	» » 29	314			» »	III	♂	30·5	33	fresh
	» » 29	383	W of Anholt. 5 fms.	56°42' 11°22'	» »	III	♂	30	35	

Table 20. Continued

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date		No on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 16.-17. SW of Anholt, Kattegat. 56°32′-56°39′ N 11°17′-11°36′ E. 15-27 meters. "Thor" St. 344-347. 305 plaice liberated (No. 96-400). "Thor"'s marking experiment No. 2 1905	1905 July	1	204	SW of Anholt. 16 fms.	56°35′	11°31′	Danish S. B.	IV	♂	29·5	30·5	tail dry
	»	2	225	W of NW-Reef, Anholt. 7 fms.	56°45′	11°20′	» »	IV	♀	31	31	dry
	»	5	214	Nordbjerg, Anholt, bearing ESE. 8 fms.	56°44′	11°19′	» »	IV	♂	26·5	27	tail dry
	»	10	356	2 miles SE of SW Point of Anholt. 15 fms.	56°40′	11°37′	» »	IV	♀	30·5	33	
	»	10	164	2 miles S by E of Anholt SW Point. 15 fms.	56°39′	11°33′	» »	IV	♂	29	30·5	mature, fresh
	»	17	211	8 miles NNE from Anholt Light. 12½ fms.	56°52′	11°43′	Swedish »	IV	♂	27·5	[37]	
	»	20	196	NW of Anholt. 8 fms.	56°50′	11°18′	Danish »	IV	♀	29	30·5	
	»	21	109	N of Anholt. 21 meters.	56°48′	11°35′	Sw Fishingb.	IV	♀	33	36	
	»	24	265	E of Sæby. 11 fms.	57°21′	10°43′	Danish S. B.	IV	♀	27·5	[25·5]	fresh
	»	26	218	"Pladen", SSW of Anholt.			» »	IV	♀	29	31·5	tail dry
	»	27	151	4 miles SE from Grenaa Harbour.	56°23′	11°03′	» »	IV	♀	27	28·5	tail dry
	»	29	192	WNW of Anholt 9 fms.	56°45′	11°18′	»Fishingb.	IV	♂	25	29	tail dry
	» August	1	396	NNE of Nordre Rønner, Læsø. 14 fms.	57°27′	10°57′	» S. B.	V	♂	26·5	26·5	living
	»	3	369	10 miles WNW of Anholt.	56°45′	11°13′	» »	V	♂	25	25·5	dry
	»	5	183	NW of Anholt. 9 fms.	56°50′	11°19′	» »	V	♀	34	37·5	immat., fresh
	»	15	128	10 miles SW of Anholt. 15½ fms.	56°35′	11°30′	Swedish »	V	♀	26	31	mature
	»	16	108	NNW of Anholt. 10 fms.	56°47′	11°14′	Danish »	V	♂	26		
	»	19	133	8 miles WNW of Anholt.	56°45′	11°17′	» »	V	♂	32	33·5	
	»	20	178	N of Anholt. 14 fms.	56°56′	11°38′	» »	V	♀	29	31	fresh
	»	20	364	NW of Anholt. 6 fms.	56°46′	11°21′	» »	V	♂	30	31	fresh
	»	28	150	2 miles SW of Anholt. 14 fms.	56°39′	11°35′	» »	V	♀	28	30·5	fresh
	»	30	127	SE of Anholt. 15 fms.	56°42′	11°44′	» »	V	♀	31·5	31·5	mature
	» »	30	173	W of Anholt.			» »	V	♀	32·5	35·5	living
	» Septbr.	3	297	Tangen. 10 fms.			» »	VI	♂	29	30	dry
	»	5	388	Anholt Light bearing NE, 8 miles from shore.	56°34′	11°27′	»Fishingb.	VI	♂	29	30·5	rotten
	» »	10	312	Pakhus Bay. 8 fms.	56°42′	11°36′	» S. B.	VI	♂	24	27·5	
	»	10	385	Pakhus Bay. 8 fms.	56°42′	11°36′	» »	VI	♂	28·5		
	»	12	102	12 miles N of Anholt.	56°55′	11°30′	» »	VI	♂	31·5	34	tail dry
	»	16	349	SW of Anholt, 8 miles from shore. 8 fms.	56°36′	11°26′	» »	VI	♂	31	33·5	living
	»	17	340	6 miles N of Anholt Light. 8 fms.	56°50′	11°37′	» »	VI	♀	26	29	mature
	»	20	176	S of SW Point, Anholt. 15 fms.	56°38′	11°35′	» »	VI	♀	29·5	30·5	fresh
	»	25	294	Pakhus Bay. 10 fms.	56°41′	11°36′	» »	VI	♂	30	31	tail dry
	»	26	96	SW of Anholt. 6 fms.	56°39′	11°28′	» »	VI	♀	31	34	mature, fresh
	» October	9	393	7 miles N of Anholt Light.	56°51′	11°37′	» »	VII	♂	26	30·5	
	»	14	115	N of Anholt. 20 fms.	56°57′	11°35′	» »	VII	♂	29	35	fresh
	»	18	124	10 miles W of Anholt. 8 fms.	56°38′	11°15′	» »	VII	♂	28·5	30	tail a little dry
	»	22	226	12 miles N of Anholt. 8 fms.	56°55′	11°32′	» »	VII	♂	26	26·5	fresh
	»	26	241	8 miles NW of Anholt. 7 fms.	56°47′	11°18′	»Fishingb.	VII	♀	30·5	34·5	living
	»		386	S by E of Anholt. 10 fms.	56°41′	11°36′	» S. B.	VII	♂	25	27	
	» Novbr.	1	136	At Middelgrunden. The Sound.	55°44′	12°40′	» »	VIII	♀	38·5		mature
	»	1	154	SSW of Læsø. 7 fms.	57°02′	10°55′	» »	VIII	♂	32	35·5	living
	»	12	158	16 miles N of Anholt, 15 fms.	57°00′	11°37′	» »	VIII	♀	33	[31]	
	»	20	112				» »	VIII	♂	27	30	
	»	29	376	4—5 miles E of Græsholm.	57°31′	10°44′	German S. T.	VIII	♂	29	31	mature
	» Dcbr.	5	229	NW of Anholt. 8 fms.	56°49′	11°17′	Danish S. B.	IX	♂	28	37	living
	»	14	138	Off SW Point, Anholt, 3 miles fr. shore. 12½ fm.	56°38′	11°32′	» »	IX	♀	30	33·5	mature, fresh
	»	22	339	20 miles SE of Anholt. 16 fms.	56°31′	12°06′	»Fishingb.	IX	♀	35	36·5	mat., living
	»	29	104	Off Høyen. 10 fms.	57°45′	10°31′	» »	IX	♀	32	38·5	
	1906 Febr.	15	116	3 miles S of Anholt. 10 fms.	56°41′	11°41′	» S. B.	XI	♀	27·5	36	fresh
	»	25	145	53°43′ N 3°22′ E. 21 fms.	53°43′	3°22′	English S. S.	XI	♂	33	37	mature, fresh
	» March	1	186	15 miles S by W of Anholt.	56°29′	11°38′	German S. T.	XII	♂	35	35	
	» »	30	198	5 miles ENE from Fornæs Light.	56°29′	11°05′	Danish S. B.	XII	♂	32·5	35	
	» April	1	130	NE of Fornæs. 8½ fms.	56°36′	11°10′	» »	XIII	♂	30	31·5	tail dry
	»	1	378	NE of Fornæs. 8½ fms.	56°36′	11°10′	» »	XIII	♀	30	37·5	tail dry
	»	10	326	9 miles NE by E from Fornæs. 9 fms.	56°33′	11°10′	» »	XIII	♀	30	35	
	» May	26	380	NE of Hanstholm. 32 fms.			» »	XIV	♂	26·5	36·5	fresh

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
	1905 June 1	264	Aalborg Bay, 20 miles from shore. 6 fms.			Swedish S. B.	XV	♂	28·5	34	
	» » 30	327	3½ miles S of Anholt Light.	56°41′	11°40′	Danish »	XV	♀	29	37	fresh
	» July 27	149	8 miles W of Anholt. 11 fms.	57°42′	11°17′	» »	XVI	♂	24·5	30·5	mature somewh. dry
	» August 2	217	10 miles NW of Anholt. 11 fms.	56°47′	11°13′	» »	XVII	♂	28	32	mature somewh. dry
1905. March 20. 2 miles W of Spirbakken Bn. Skagerak. 57°42′ N 10°23′ E. 17 meters. "Thor" St. 349. 200 plaice liberated (No. 401—600). "Thor"s marking experiment No. 3 1905	1905 March 27	401	Off Skagen's old Light. 8 fms.	57°45′	10°32′	Dan. Fishingb.	0	♂	27	25·5	
	» » 27	436	N of Højen's Light. 15 fms.	57°45′	10°34′	» »	0	♀	28	27	
	» » 27	468	NE of Højen's Light. 7 fms.	57°45′	10°35′	» »	0	♂	26·5	25	
	» » 27	496	N by E of Højen's Light. 27 fms.	57°46′	10°34′	» »	0	♀	26·5	26	
	» » 29	566	Off Tversted. 6 fms.	57°38′	10°10′	» S. B.	0	♂	27	27·5	
	» April 1	493	Off Kandestederne. 4 fms.	57°40′	10°20′	» »	1	♀	28·5	28	
	» » 4	528	N of Skagen's Light. 5 fms.	57°45′	10°37′	» Fishingb.	I	♀	29	28	
	» » 5	534	SE of Skagen, 4 miles from shore.	57°41′	10°43′	» S. B.	I	♂	25·5	25·5	
	» » 6	439	N of Højen's Light. 15 fms.	57°45′	10°34′	» Fishingb.	I	♀	29	29	
	» » 6	502	NW of Skagen's Light. 7 fms.	57°45′	10°37′	» »	I	♀	29	28	
	» » 10	438	½ mile W of Skagen. 5 fms.	57°43′	10°36′	» »	I	♀	29·5	29	
	» » 10	595	NW of Skagen's Light. 7 fms.	57°45′	10°37′	» »	I	♂	31·5	30·5	
	» » 11	565	NW of Skagen's Light. 15 fms.	57°46′	10°35′	» »	I	♀	29·5	28·5	
	» » 15	574	Off Tversted. 9 fms.	57°38′	10°11′	» S. B.	I	♀	28	28	
	» » 20	539	NE of Hirshals. 10 fms.	57°40′	10°04′	» »	I	♀	30·5	31·5	
	» » 24	588	Off Skagen. 5 fms.	57°42′	10°35′	» Fishingb.	I	♀	30	30	
	» » 30	570	NNE of Skagen's Light. 8 fms.	57°45′	10°39′	» »	I	♀	25·5	26·5	a little dry
	» May 1	453	Højen's Whistling-buoy.	57°44′	10°28′	» S. B.	II	♀	28·5	28	
	» » 2	432	4 miles SE of Skagen's Light-ship. 14 fms.	57°43′	10°49′	» »	II	♀	27	27	
	» » 3	526	NE of Højen's Light. 13 fms.	57°46′	10°35′	» Fishingb.	II	♀	30	30·5	
	» » 3	553	24 miles NW of Hirshals. 20 fms.	57°42′	9°09′	» S. B.	II	♂	29	30	
	» » 3	581	SE of Skagen's Light. 5 fms.	57°43′	10°39′	» Fishingb.	II	♂	27	26·5	
	» » 4	513	N of Bulbjerg. 7 fms.	57°12′	9°01′	» S. B.	II	♀	27·5	28	
	» » 4	524	N of Bulbjerg. 8 fms.	57°14′	9°00′	» »	II	♀	28	28·5	
	» » 4	555	N of Højen's Light. 4 fms.	57°45′	10°34′	» Fishingb.	II	♂	24·5	24	tail dry
	» » 4	585	SE of Skagen's Light. 6 fms.	57°43′	10°40′	» »	II	♂	30·5	30	tail dry
	» » 6	495	2 miles W of Hirshals. 1 mile from shore.	57°34′	9°53′	» »	II	♀	29	29	
	» » 6	552	Aalbæk Bay. 8 fms.			» »	II	♂	25·5	25·5	
	» » 9	571	2 miles NW of Hirshals.	57°36′	9°54′	» »	II	♂	27	26·5	
	» » 10	594	Off Hirshals. 10 fms.	57°37′	9°55′	» S. B.	II	♀	31	32	
	» » 11	537	NW of Tversted. 10 fms.	57°40′	10°02′	» »	II	♂	29·5	29·5	
	» » 13	573	NW of Hirshals. 18 fms.	57°40′	9°47′	» »	II	♀	30·5	31·5	
	» » 16	567	Off Tversted Bn. 2 miles from shore. 7 fms.	57°38′	10°10′	» Fishingb.	II	♀	30	31	dry
	» » 16	569	Off Tversted. 10 fms.	57°39′	10°11′	» S. B.	II	♀	29	29	
	» » 17	507	Off Tversted. 4 fms.	57°37′	10°11′	» »	II	♀	23	23·5	
	» » 17	590	Off Tversted, 9 fms.	57°39′	10°09′	» »	II	♀	30	30·5	
	» » 18	532	Off Hirshals.			» Fishingb.	II	♀	29	30	
	» » 23	506	N of Kandestederne. 3 fms.	57°40′	10°21′	» »	II	♀	25·5	26	
	» » 23	558	SE of Hulsig church. 4 fms.	57°38′	10°32′	» »	II	♂	26·5	27	
	» » 25	538	Off Tversted Bn. 6 fms.	57°38′	10°10′	» »	II	♀	24	24	somewh. dry
	» » 29	582	Off Hirshals. 19 fms.	57°41′	9°55′	» S. B.	II	♀	30	32	
	» » 30	561	Off Tversted Bn. 2 miles from shore. 10 fms.	57°38′	10°10′	» »	II	♀	28·5	31	
	» » 30	576	Off Rubjerg Knude. 19 fms.	57°36′	9°29′	» »	II	♀	28	27	
	» » 31	577	12 miles N of Hirshals. 27 fms.	57°46′	9°56′	» »	II	♂	28	27	
	» » 31	578	Off Kandestederne. 3 fms.	57°39′	10°20′	» Fishingb.	II	♀	23·5	21	
	» June 8	430	Off Vesterby, Skagen. 4 fms.	57°43′	10°36′	» »	III	♀	29	28·5	
	» » 10	483	Off Tversted. 7 fms.	57°38′	10°10′	» S. B.	III	♀	27	28·5	
	» » 26	529	Off Tversted. 13 fms.	57°45′	10°14′	» »	III	♀	27	30·5	
	» » 29	512	W of Spirbakken. 3 miles from shore. 17 fms.	57°44′	10°25′	» »	III	♂	23·5	25·5	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
	1905 July 12	560	8 miles N of Læsø. 12 fms.	57°27′	10°59′	Sw. Fishingb.	IV	♂	24	29	
	» » 16	587	NW of Hirshals. 20 fms.	57°39′	9°44′	Danish S.B.	IV	♂	28·5	31	
	» August 1	579	NW of Hirshals. 22 fms.	57°40′	9°43′	» »	V	♀	27	32	living
	» Sept. 23	509	NW of Hirshals. 40 fms.	57°42′	9°51′	» »	VI	♂	23·5	28	
	Nov. 23	564	E of Rusmandsbanken, NE of Læsø. 13 fms.	57°22′	11°16′	» »	VIII	♀	30·5	37	living
	1906 Jan. 24	504	N of Skagen. 20 fms.	57°46′	10°35′	» Fishingb.	X	♀	30	33·5	fresh
	» » 25	547	NE of Trindelen's Light. 25 fms.	57°30′	11°21′	Swedish S.T.	X	♀	27·5	30	
1905. March 22. Off Bulbjerg—Svinkleven, Skagerak. 57°12′—57°18′N 9°09′—9°17′ E. 10—16 meters. 575 Plaice liberated (No. 601—1175). "Thor"'s marking experiment No. 4 1905.	1905 March 23	888	Bulbjerg bearing SSW by S. 8 fms.	57°12′	9°03′	Danish S.B.	0	♂	26	26	
	» » 23	981	Bulbjerg bearing SSW by S. 8 fms.	57°12′	9°03′	» »	0	♀	28·5	27	
	» » 23	943	Bulbjerg bearing SSW by S. 8 fms.	57°12′	9°03′	» »	0	♀	27	27	
	» » 23	968	Bulbjerg bearing SSW by S. 8 fms.	57°12′	9°03′	» »	0	♂	26·5	26·5	
	» » 24	642	12 miles NE of Bulbjerg. 11 fms.	57°20′	9°12′	» »	0	♂	27	26·5	
	» » 24	655	NE of Hanstholm. 9 fms.	57°09′	8°38′	» »	0	♀	29·5	29	
	» » 24	691	NE of Hanstholm. 9 fms.	57°09′	8°38′	» »	0	♀	29·5	29	
	» » 24	707	NE of Bulbjerg, 12 miles from shore. 11 fms.	57°21′	9°09′	» »	0	♂	29	29	
	» » 24	756	12 miles NE of Bulbjerg 11 fms.	57°20′	9°12′	» »	0	♀	27·5	27·5	
	» » 24	810	6 miles N of Bulbjerg. 10 fms.	57°15′	8°59′	» »	0	♀	28·5	28	
	» » 24	893	6 miles N of Bulbjerg. 10 fms.	57°15′	8°59′	» »	0	♀	25	24·5	
	24	905	6 miles N of Bulbjerg. 10 fms.	57°15′	8°59′	» »	0	♀	28	28	
	» » 24	952	6 miles N of Bulbjerg. 10 fms.	57°15′	8°59′	» »	0	♀	30	30	
	» » 24	964	6 miles N of Bulbjerg, 10 fms.	57°15′	8°59′	» »	0	♂	26·5	26	
	» » 26	779	8 miles NNE of Bulbjerg. 8 fms.	57°17′	9°07′	» »	0	♂	27	27	
	» » 29	749	Off Bulbjerg. 7 fms.	57°12′	9°02′	» »	0	♂	27	27	
	» » 29	1067	Off Bulbjerg. 7 fms.	57°12′	9°02′	» »	0	♂	27	26·5	
	» » 29	1169	Off Bulbjerg. 7 fms.	57°12′	9°02′	» »	0	♀	28·5	28·5	
	» April 4	763	6 miles NE of Bulbjerg. 9½ fms.	57°15′	9°08′	» »	I	♀	26	26	
	» » 4	1166	6 miles NE of Bulbjerg. 9 fms.	57°14′	9°07′	» »	I	♀	30	29·5	
	» » 10	667	NE of Skagen's Light. 15 fms.	57°46′	10°40′	» Fishingb.	I	♀	26	25·5	
	» » 10	712	N of Skagen's Light. 4 fms.	57°45′	10°38′	» »	I	♂	26	26	
	10	867	N of Skagen's Light. 4 fms.	57°45′	10°38′	» »	I	♂	29·5	29	
	» 11	1007	S of Skagen. 8 fms.	57°41′	10°37′	» »	I	♂	23·5	23	
	» 11	1071	NW of Skagen's Light. 7 fms.	57°45′	10°37′	» »	I	♀	26·5	26·5	
	15	780	N of Bulbjerg.			» S.B.	I	♂	29	28	
	15	816	N of Bulbjerg. 7½ fms	57°13′	9°00′	» »	I	♀	27·5	26·5	
	» » 15	971	N of Bulbjerg. 7½ fms.	57°13′	9°00′	» »	I	♀	26	26	
	» » 15	994	N of Bulbjerg. 8 fms.	57°14′	9°00′	» »	I	♂	33·5	33	
	» » 15	1141	N of Bulbjerg. 8 fms.	57°14′	9°00′	» »	I	♀	31	31	
	15	1149	Hanstholm Light bearing ENE. 7 fms.	57°05′	8°31′	» »	I	♂	27·5	27	
	» 18	628	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♂	28	27·5	
	» » 18	662	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♂	25·5	25	
	» 18	840	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♂	25	24·5	
	» » 18	844	Between Svinkleven and Bulbjerg. 7 fms.	57°16′	9°09′	» »	I	♀	25·5	25·5	
	» » 18	863	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♂	29·5	28·5	
	» » 18	956	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♀	27	26·5	
	» 18	1004	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♂	31	30·5	
	» 18	1081	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♂	30	29·5	
	» » 18	1024	4 miles N of Bulbjerg. 6½ fms.	57°13′	9°00′	» »	I	♀	27	27	
	» » 19	948	Off Rubjerg. 8 fms	57°27′	9°43′	» »	I	♂	30·5	29·5	somewh. dry
	» 20	673	Between Svinkleven and Bulbjerg. 8 fms.	57°17′	9°13′	» »	I	♀	26	25	
	» 20	788	NNE of Bulbjerg, 6 miles from shore. 8 fms.	57°15′	9°03′	» »	I	♂	29	29·5	
	20	1070	Betw. Svinkleven and Bulbjerg. 8 m. fr. sh. 8 fm.	57°17′	9°13′	» »	I	♂	27	26·5	
	20	1074	Betw. Svinkleven and Bulbjerg. 8 m. fr. sh. 8 fm.	57°17′	9°13′	» »	I	♀	30·5	29·5	
	21	752	NE of Bulbjerg. 9 fms.	57°14′	9°07′	» »	I	♂	30	30·5	
	21	950	NE of Bulbjerg. 9 fms.	57°14′	9°07′	» »	I	♀	27·5	25·5	
	24	636	NE of Bulbjerg, 12 miles from shore. 11 fms.	57°20′	9°12′	» »	I	♂	27	27	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery											Remarks
	Date		No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	
1905 March 22. Off Bulbjerg—Svinkleven, Skagerak. 57°12′—57°18′N 9°09′—9°17′E. 10—16 meters. 575 Plaice liberated (No 601—1175). "Thor"s marking experiment No 4 1905.	1905 April	26	989	Aalbæk Bay. 8 fms.	57°36′	10°35′	Dan. Fishingb.	I	♀	30	29·5	
	» »	26	1161	Aalbæk Bay. 8 fms.	57°36′	10°35′	» »	I	♀	28	28	
	» »	27	676	Between Svinkleven and Bulbjerg. 8 fms.	57°17′	9°13′	» S. B.	I	♀	27·5	27·5	
	» »	29	783	NE of Højen's Light. 5 fms.	57°45′	10°34′	» Fishingb.	I	♂	30·5	30·5	somewh. dry
	» »	29	1000	NE of Højen's Light, 4 fms.	57°45′	10°34′	» »	I	♂	26	26	a little dry
	» »	29	1050	SW of Skagen's Light 4 fms.	57°43′	10°37′	» »	I	♂	28·5	28·5	somewh. dry
	» May	1	980	3 miles NE of Hanstholm. 10 fms.	57°10′	8°40′	» S. B.	II	♀	28		
	» »	2	605	NE of Hirshals. 10 fms.	57°39′	10°01′	» »	II	♀	27	25·5	
	» »	2	622	NE of Bulbjerg. 8 fms.	57°14′	9°07′	» »	II	♀	29·5	29	
	» »	2	858	NE of Bulbjerg. 10 fms.	57°21′	9°16′	» »	II	♂	29·5	29	
	» »	2	892	NE of Bulbjerg. 10 fms.	57°21′	9°16′	» »	II	♂	31·5	31	
	» »	2	918	N of Bulbjerg. 11 fms.	57°15′	9°00′	» »	II	♂	28	28·5	
	» »	2	929	NE of Hanstholm. 9 fms.	57°09′	8°38′	» »	II	♀	30	31	
	» »	2	978	NNE of Bulbjerg. 14 miles fr. shore. 12 fms.	57°23′	9°07′	» »	II	♂	28	29·5	
	» »	2	1027	N of Svinkleven. 7 fms.	57°17′	9°18′	» »	II	♀	26	26	
	» »	2	1079	NE of Bulbjerg. 10 fms.	57°21′	9°16′	» »	II	♂	28	27·5	
	» »	2	1096	Vorsaa pr. Asaa.	57°11′	10°33′	» Fishingb.	II	♂	28	27·5	somewh. dry
	» »	2	1103	NNE of Bulbjerg. 8 miles from shore. 12 fms.	57°18′	9°02′	» S. B.	II	♀	28	28	
	» »	2	1140	NE of Bulbjerg. 10 fms.	57°21′	9°16′	» »	II	♂	27·5	27	
	» »	2	1142	NE of Hirshals. 10 fms.	57°38′	10°01′	» »	II	♀	26·5	25·5	
	» »	3	619	NW of Højen's Light. 10 fms.	57°45′	10°32′	» »	II	♂	28	28	
	» »	3	669	Off Bulbjerg. 2 miles from shore. 7 fms.	57°12′	9°02′	» »	II	♀	28	28	
	» »	3	687	NE of Hanstholm. 8 fms.	57°10′	8°40′	» »	II	♀	29·5	29	
	» »	3	727	NE of Hanstholm. 8 fms.	57°10′	8°40′	» »	II	♀	29·5	29	
	» »	3	894	NE of Bulbjerg. 7 fms.	57°13′	9°06′	» »	II	♂	28	28	
	» »	3	935	Off Bulbjerg. 2 miles from shore. 7 fms.	57°12′	9°02′	» »	II	♂	28·5	29	
	» »	3	1056	NE of Hanstholm. 8 fms.	57°10′	8°40′	» »	II	♀	27·5	26·5	
	» »	4	616	N of Bulbjerg. 7 fms.	57°12′	9°01′	» »	II	♂	28	28	
	» »	4	809	N of Bulbjerg. 7 fms.	57°12′	9°01′	» »	II	♀	28·5	29	
	» »	4	817	NE of Bulbjerg. 7 fms.	57°13′	9°06′	» »	II	♀	30·5	31	
	» »	4	818	N of Bulbjerg. 10 fms.	57°15′	9°00′	» »	II	♂	27	26	
	» »	4	849	Off Tversted. 20 fms.	57°43′	10°06′	» »	II	♀	30·5	31	
	» »	4	869	N of Bulbjerg. 10 fms.	57°15′	9°00′	» »	II	♀	30	28·5	
	» »	4	902	NE of Bulbjerg. 7 fms.	57°13′	9°06′	» »	II	♀	30·5	31·5	
	» »	4	914	N of Svinkleven. 6 fms.	57°14′	9°15′	» »	II	♀	27·5	28	
	» »	4	953	N of Bulbjerg. 10 fms.	57°15′	9°00′	» »	II	♀	29	29	
	» »	4	992	N of Bulbjerg. 10 fms.	57°15′	9°00′	» »	II	♂	29	28·5	
	» »	4	1023	NE of Bulbjerg. 7 fms.	57°13′	9°06′	» »	II	♂	29	29	
	» »	4	1037	NE of Bulbjerg. 7 fms.	57°13′	9°06′	» »	II	♀	26	26	
	» »	4	1038	N of Bulbjerg. 7 fms.	57°12′	9°01′	» »	II	♂	27	27·5	
	» »	4	1073	N of Bulbjerg. 10 fms.	57°15′	9°00′	» »	II	♀	26	25 5	
	» »	4	1135	N of Bulbjerg. 10 fms.	57°15′	9°00′	» »	II	♀	29	28	
	» »	5	769	N of Bulbjerg. 7 fms.	57°12′	9°01′	» »	II	♂	29	29·5	
	» »	5	806	6 miles N of Svinkleven. 7 fms.	57°15′	9°17′	» »	II	♀	30	30·5	
	» »	5	820	1¼ mile SW of Løkken. 3 fms.	57°22′	9°40′	» »	II	♂	29·5	29·5	
	» »	5	1121	N of Bulbjerg. 7 fms.	57°12′	9°01′	» »	II	♀	29·5	30	
	» »	5	1129	N of Bulbjerg. 7 fms.	57°12′	9°01′	» »	II	♀	27·5	28	
	» »	6	675	N of Bulbjerg. 6 fms.	57°11′	9°02′	» »	II	♂	26	27	
	» »	6	682	Off Skiveren, Tversted. 6 fms.	57°38′	10°14′	» »	II	♀	26·5	26	
	» »	6	735	N of Bulbjerg. 8 fms.	57°14′	9°02′	» »	II	♂	28	29	
	» »	6	860	N of Bulbjerg. 6 fms.	57°11′	9°00′	» »	II	♂	27	27·5	
	» »	6	924	N of Bulbjerg, 7 fms.	57°12′	9°01′	» »	II	♀	29	29·5	
	» »	6	944	3 miles SE of Cancer. 7 fms.	55°28′	8°07′	» »	II	♂	27·5	27·5	
	» »	6	946	NE of Bulbjerg. 5 fms.	57°11′	9°03′	» »	II	♂	28	28·5	
	» »	6	1046	ENE of Hanstholm. 12 fms.			» »	II	♀	28·5	28·5	
	» »	7	630	7 miles NE of Hanstholm. 9 fms.	57°12′	8°46′	» »	II	♂	28·5	28	

Table 20. Continued

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 22. Off Bulbjerg—Svinkleven, Skagerak. 57°12′—57°18′N 9°09′—9°17′ E. 10—16 meters. 575 Plaice liberated (No. 601—1175). "Thor"s marking experiment No. 4 1905	1905 May 7	635	12 miles N of Horns Reef Light-ship. 11 fms.	55°46′	7°19′	Danish S. B.	II	♀	29	28·5	
	7	649	2 miles NE of Hanstholm. 10 fms.	57°09′	8°38′	» »	II	♀	28	29	
	7	793	ENE of Hanstholm. 12 fms.			» »	II	♂	27	27	
	7	883	7 miles NE of Hanstholm. 9 fms.	57°12′	8°46′	» »	II	♂	27	27	
	7	1063	7 miles NE of Hanstholm. 9 fms.	57°12′	8°46′	» »	II	♀	27·5	27	
	10	659	NE of Hanstholm. 10 fms.	57°09′	8°39′	» »	II	♀	28	28·5	
	10	725	N of Svinkleven. 6 fms.	57°15′	9°16′	» »	II	♂	31·5	31·5	
	10	1022	Off Skallerup. 4 fms.	57°30′	9°49′	» »	II	♂	29·5	29	
	10	1042	N of Hanstholm. 12 fms.			» »	II	♀	30	30	
	10	1117	4 miles W by N of Hanstholm.	57°07′	8°29′	» »	II	♀	27	27	
	10	1132	N of Bulbjerg. 8 fms.	57°14′	9°00′	» »	II	♂	29	30	
	10	1153	N of Hirshals.			» »	II	♂	30	30	
	12	617	N of Bulbjerg. 7 fms.	57°12′	9°02′	» »	II	♀	30·5	31·5	
	12	829	NE of Hirshals. 10 fms.	57°40′	10°02′	» »	II	♂	27·5	27·5	
	12	983	N of Hanstholm. 10 fms.	57°08′	8°36′	» »	II	♀	25·5	26	
	12	1162	Off Blokhus. 5 fms.	57°16′	9°33′	» Fishingb.	II	♀	29	28	dry
	12	1170	1 mile NW of Løkken.	57°23′	9°41′	» S. B.	II	♂	29	[26·5]	
	13	873	NW of Skagen's Light. 5 fms.	57°45′	10°36′	» Fishingb.	II	♀	30	30	
	13	887	SE of Skagen's Light. 7 fms.	57°43′	10°39′	» »	II	♀	25	24	
	13	917	NW of Skagen's Light.			» »	II	♀	27·5	[24]	
	13	1108	N of Bulbjerg, 2 miles from shore. 5 fms.	57°11′	9°01′	» S. B.	II	♂	27	28	
	13	1125	4 miles SW of Cancer. 10 fms.	55°24′	7°54′	» »	II	♀	29	29	
	13	1163	NW of Skagen's Light. 4 fms.	57°45′	10°37′	» Fishingb.	II	♂	27·5	28	tail dry
	15	1040	North Sea, off Thyborøn Canal. 3 fms.	56°43′	8°13′	» S. B.	II	♂	25·5		
	16	1006	Hulsig church bearing NW. 6 fms.	57°37′	10°33′	» Fishingb.	II	♀	27	28	
	17	720	S of Skagen's Light. 3 fms.	57°44′	10°38′	» »	II	♀	24·5	22·5	
	18	812	3/4 mile NNW of Klitmøller. 4 fms.	57°03′	8°29′	» S. B.	II	♀	28	27	
	20	634	Off Tuskjer, 1 mile from shore.	56°28′	8°05′		II	♀	28·5	30	
	20	702	Off Blokhus. 5 fms.	57°16′	9°33′	» »	II	♀	27	28·5	
	21	632	1 miles NW of Løkken.	57°23′	9°41′	» Fishingb.	II	♀	25·5	26	somewh. dry
	24	877	54°50′N 8°10′E.	54°50′	8°10′	English S. S.	II	♀	30	30·5	sound
	24	1102	2 miles WNW of Ringebjerg. 8 fms.	55°38′	8°02′	Danish S. B.	II	♀	29·5	30·5	
	26	755				Scotish S. S.	II	♂	28	27	sound
	26	879	At Hanstholm.			Danish S. B.	II	♀	27	27	a little dry
	26	930	8 miles NW of Blaavand's Light. 8 fms.	55°38′	7°52′	» »	II	♀	30·5	31	
	26	1013	2 miles NW of Thorsminde. 6 1/2—7 fms.	56°23′	8°05′	» »	II	♀	31	30·5	
	26	1065	At Hanstholm.			» »	II	♀	29	30·5	somewh. dry
	26	1076	At Hanstholm.			» »	II	♀	27	26·5	somewh. dry
	26	1115	At Hanstholm.			» »	II	♂	30·5	30·5	somewh. dry
	27	601	S of Skagen's old church. 8 fms.	57°40′	10°35′	» Fishingb.	II	♀	28	28·5	
	27	1112	3/4 mile NW of Ringebjerg. 6 fms.	55°39′	8°03′	» S. B.	II	♂	28·5	29	
	29	1049	Off Tversted. 3 fms.	57°36′	10°11′	» Fishingb.	II	♀	27·5	27·5	
	29	1174	Off the mole of Hirshals.	57°36′	9°58′	» »	II	♀	26	27	somewh. dry
	30	1098	Off Tversted Bn. 2 miles distant.	57°38′	10°10′	» S.B.	II	♂	28	29	
	31	640	SSE of Sæby. 5 fms.	57°16′	10°38′	» Fishingb.	II	♂	25·5	25·5	
	31	641	Off Blokhus. 6 fms.	57°17′	9°31′	» »	II	♀	28	28·5	dry
	31	772	Off Blokhus. 5 fms.	57°16′	9°33′	» S. B.	II	♂	30·5	32·5	
	31	773	Off Blokhus. 5 fms.	57°16′	9°33′	» »	II	♀	29·5	30·5	
	31	833	Skagerak, off Tranum. 3 fms.	57°11′	9°24′	» »	II	♂	26·5	28	
	31	913	NNE of Hirshals. 30 fms.	57°43′	10°00′	» »	II	♀	29·5	31	
	31	961	Off Blokhus. 5 fms.	57°16′	9°33′	» »	II	♂	29	31	
	June 1	901	55°40′N 7°55′E. 7 fms.	55°40′	7°55′	English S. T.	III	♂	25·5	24·5	dried and salted
	2	696	4 miles NW of Slugen N. 8 1/2 fms.			Danish S. B.	III	♂	26·5		
	2	716	24 miles NNW of Rubjerg Knude. 19 fms.	57°45′	9°24′	» »	III	♀	29·5	30·5	
	2	1145	Off Blokhus. 5 fms.	57°16′	9°33′	» »	III	♂	27	27	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery												
	Date			No. on Label	Locality reported	Central Position (Approximately)		Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
						N	E						
1905. March 22. Off Bulbjerg—Svinkleven, Skagerak. 57°12′—57°18′ N 9°09′—9°17′ E. 10—16 meters. 575 Plaice liberated (No. 601—1175). "Thor"s marking experiment No. 4 1905.	1905	June	3	633	Off Blokhus. 5 fms.	57°16′	9°33′	Danish S. B.	III	♂	27	27·5	
	»	»	3	748	Off Blokhus. 5 fms.	57°16′	9°33′	» »	III	♂	28	29	
	»	»	3	949	Off Blokhus, Skagerak. 5 fms.	57°16′	9°33′	» »	III	♂	27·5	27·5	fresh
	»	»	3	959	12 miles WSW of Graadyb. 10 fms.	55°21′	7°58′	» »	III	♀	26	26	
	»	»	3	988	N of Svinkleven. 5 fms.	57°12′	9°17′	» »	III	♂	26	26·5	
	»	»	4	623	55°05′ N 7°52′ E. 10 fms.	55°05′	7°52′	English S. S.	III	♂	29·5	30	sound
	»	»	5	975	55°40′ N 7°30′ E. 13 fms.	55°40′	7°30′	» S. T.	III	♀	30	30	sound
	»	»	7	742	2 miles E of Hirsholmene.	57°30′	10°41′	Dan. Fishingb.	III	♂	25·5	26	
	»	»	7	1152	55°43′ N 7°30′ E. 10 fms.	55°43′	7°30′	English S. T.	III	♀	31	30	dried and salted
	»	»	8	907	E of Skagen's Light-ship. 22 fms.	57°46′	10°45′	Danish S. B.	III	♂	27	28·5	
	»	»	10	1093	NW of Hirshals. 19 fms.	57°40′	9°45′	» »	III	♂	25	26	
	»	»	11	1106	2 miles W of Nymindegab. 8 fms.	55°48′	8°07′	» »	III	♀	29·5	30·5	
	»	»	15	886	Off Kærgaarde Bn. 8 fms.	55°42′	8°04′	» »	III	♂	29	31·5	
	»	»	17	1119	Bulbjerg bearing S by W. 15 fms.	57°30′	9°01′	» Fishingb.	III	♀	27	28·5	
	»	»	19	709	6—7 miles NW of Hirshals.	57°39′	9°47′	» S. B.	III	♂	28·5	30·5	
	»	»	19	1097	1 mile NW of the NW Reef Light of Læsø. 10 fms.	57°18′	10°44′	» »	III	♂	28	27	
	»	»	20	955				» »	III	♀	28	30	
	»	»	20	602	55°45′ N 7°31′ E. 10 fms.	55°45′	7°31′	English S. T.	III	♂	29·5	30	
	»	»	23	1008	S of Skagen, 7 fms.	57°42′	10°37′	Dan. Fishingb.	III	♀	28·5	29	
	»	»	24	880	Off Tversted. 8 fms.	57°38′	10°09′	» »	III	♀	29	30·5	
	»	»	26	972	Rubjerg Knude bearing SE. 17 fms.	57°38′	9°17′	» »	III	♂	29 5	29	
	»	»	27	1118	Off Tversted. 25 fms.	57°43′	10°08′	» S. B.	III	♂	28·5	30	
	»	»	28	671	8 miles NW of Hirshals. 25 fms.	57°40′	9°44′	» »	III	♂	28	28	
	»	»	28	1017	8 miles NW of Hirshals. 25 fms.	57°40′	9°44′	» Fishingb.	III	♀	31	34	
	»	»	28	1048	N of Skagen. 5 fms.	57°45′	10°35′	» »	III	♀	30	31	
	»	»	28	1111	56°30′ N 7°50′ E. 13 fms.	56°30′	7°50′	English S. S.	III	♂	29	32	sound
	»	»	29	694	NW of Hirshals. 25 fms.	57°40′	9°44′	Danish S. B.	III	♀	26·5	29	
	»	»	29	698	NW of Hirshals. 25 fms.	57°40′	9°44′	» »	III	♀	29	31	
	»	»	29	799	16 miles N of Hirshals. 18 fms.	57°49′	9°41′	» »	III	♂	28·5	31·5	
	»	»	29	957	S of Skagen's old church. 7 fms.	57°42′	10°36′	» Fishingb.	III	♀	29	28·5	
	»	»	29	991	NE of Hanstholm. 30 fms.			» S. B.	III	♀	29·5	31·5	
	»	»	30	681	S of Skagen. 6 fms.	57°43′	10°38′	» Fishingb.	III	♂	28	29	
	»	»	30	684	SW of Anholt, 4 miles from shore.	56°38′	11°30′	» S. B.	III	♀	29	31·5	fresh
	»	»	30	874	NW of Hirshals. 16 fms.	57°38′	9°47′	» »	III	♀	25·5	28·5	
	»	July	2	762	NW of Hirshals. 18 fms.	57°39′	9°45′	» Fishingb.	IV	♂	29	31·5	
	»	»	2	804	N of Bulbjerg. 8 fms.	57°14′	9°00′	» S. B.	IV	♂	30	[27]	
	»	»	2	847	N of Bulbjerg. 8 fms.	57°14′	9°00′	» »	IV	♂	26	26·5	
	»	»	2	899	NW of Hirshals. 20 fms.	57°39′	9°42′	» »	IV	♀	29·5	31·5	
	»	»	2	1113	NW of Hirshals. 18 fms.	57°39′	9°45′	» Fishingb.	IV	♀	29	31·5	
	»	»	3	683	4 miles NW of Hirshals. 15 fms.	57°38′	9°50′	» »	IV	♀	26·5	28·5	
	»	»	4	717	NW of Rubjerg Knude. 14 fms.	57°38′	9°17′	» S. B.	IV	♂	26	28·5	
	»	»	4	757	NE by N of Hanstholm. 20 fms.	57°30′	8°53′	» »	IV	♂	25·5	27	
	»	»	4	808	NW of Rubjerg Knude. 14 fms.	57°38′	9°17′	» »	IV	♀	28	31	
	»	»	4	1165	NW of Hirshals. 16 fms.	57°37′	9°47′	» »	IV	♀	29	31·5	
	»	»	4	1171	NW of Rubjerg Knude. 14 fms.	57°38′	9°17′	» »	IV	♂	25	28	
	»	»	6	890	8 miles NNE of Horns Reef Light-ship. 10½ fm.	55°42′	7°22′	» »	IV	♂	29	31	
	»	»	11	603	WNW of Hirshals. 18 fms.	57°37′	9°36′	» »	IV	♀	27·5	31	
	»	»	11	977	57°28′ N 8°30′ E. 32 fms.	57°28′	8°30′	English S. T.	IV	♂	27	30·5	sound
	»	»	12	1114	At Hanstholm. 24 fms.			Danish S. B.	IV	♀	27·5	31	somewh. dry
	»	»	14	648	30 miles NW of Rubjerg Knude. 18 fms.			» »	IV	♀	29·5	33·5	
	»	»	15	639	NW of Hirshals. 17 fms.	57°39′	9°48′	» »	IV	♂	26·5	28·5	
	»	»	15	674	24 miles W of Hirshals. 18 fms.	57°37′	9°12′	» »	IV	♂	27	30·5	
	»	»	15	700	NW of Hirshals. 20 fms.	57°40′	9°45′	» »	IV	♂	28·5	30·5	
	»	»	15	713	NW of Hirshals. 17 fms.	57°38′	9°46′	» »	IV	♀	33	33	
	»	»	15	719	NW of Hirshals. 17 fms.	57°38′	9°46′	» »	IV	♀	29·5	29·5	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery												
	Date		No. on Label	Locality reported	Central Position (Approximately) N	Central Position (Approximately) E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 22. Off Bulbjerg—Svinkleven, Skagerak. 57°12′—57°18′N 9°09′ - 9°17′ E. 10—16 meters. 575 Plaice liberated (No. 601—1175). "Thor"s marking experiment No. 4 1905	1905 July	15	787	NW of Hirshals. 19 fms.	57°40′	9°45′	Danish »	IV	♂	28	32	
	» »	15	800	NW of Hirshals. 14 fms.	57°38′	9°47′	» »	IV	♀	25·5	30	
	» »	15	822	NW of Hanstholm. 19 fms.	57°14′	8°16′	» »	IV	♂	28	32	
	» »	15	824	NW of Hirshals. 16 fms.	57°39′	9°47′	» »	IV	♀	26·5	31	
	» »	15	832	NW of Hirshals. 24 fms.	57°40′	9°43′	» »	IV	♂	28·5	33	
	» »	15	836	NW of Hirshals. 21 fms.	57°40′	9°45′	» »	IV	♂	28	30	
	» »	15	837	NW of Hirshals. 15 fms.	57°39′	9°49′	» »	IV	♀	30	33·5	
	» »	15	911	16 miles NW of Hirshals. 16 fms.	57°44′	9°32′	» »	IV	♂	28·5	32·5	
	» »	15	925	NE of Hanstholm. 20 fms.			» »	IV	♀	26	28	
	» »	15	1083	NW of Hirshals. 17 fms.	57°38′	9°47′	» »	IV	♂	26	28·5	
	» »	15	1136	NW of Hanstholm. 19 fms.	57°14′	8°16′	» »	IV	♂	30	32·5	
	» »	15	1139	NE of Hanstholm. 20 fms.			» »	VI	♀	29	30	
		15	1159	NW of Rubjerg Knude. 14 fms.	57°38′	9°17′	» »	IV	♀	27	28	
	»	16	743	NNE of Hanstholm. 21 fms.	57°27′	8°43′	» »	IV	♂	29	32·5	
	»	16	838	Off Bulbjerg. 19 fms.	57°32′	8°59′	» »	IV	♂	27·5	31	fresh
	» »	16	862	NNE of Hanstholm. 28 fms.	57°30′	8°44	» »	IV	♂	28	31	
	»	16	979	NW of Hirshals. 21 fms.	57°40′	9°44′	» »	IV	♂	29	32	
	»	16	1041	W of Hirshals, 20 miles from shore.	57°31′	9°20′	» »	IV	♂	26	28	fresh
		17	777	NW of Hirshals. 20 fms.	57°39′	9°45′	» »	IV	♂	31	[23·5]	fresh
	» »	17	997	Off Bulbjerg. 19 fms.	57°32′	8°57′	» »	IV	♀	25	30	
	» »	17	891	NW of Rubjerg Knude. 14 fms.	57°38′	9°17′	» »	IV	♂	29	32	fresh
	» »	24	706	NW of Hirshals. 16 fms.	57°38′	9°46′	» »	IV	♀	29·5	33	living
		24	744	S of Skagen's Light-ship. 14 fms.	57°45′	10°45′	» »	IV	♂	24	[23·5]	living tail stunted
		24	781	W of Rubjerg Knude. 35 fms.	57°34′	8°51′	» »	IV	♂	29	36	living
	» »	24	995	N of Hirshals. 27 fms.	57°41′	9°54′	» »	IV	♂	28·5	30	salted
	»	24	1019	8 miles NW of Hirshals. 20 fms.	57°39′	9°55′	» »	IV	♀	25	30	fresh
		25	666	NNE of Hanstholm. 25 fms.	57°29′	8°43′	» »	IV	♀	29·5	31·5	living
		25	795	NW of Hirshals. 19 fms.	57°40′	9°45′	» »	IV	♀	27	30	living
		25	796	N of Bulbjerg. 18 fms.	57°31′	8°56′	» »	IV	♂	26·5	31	living
		26	973	NE of Hanstholm. 16 fms.	57°15′	8°45′	» »	IV	♀	28	33	fresh
		28	912	N of Bulbjerg 18 fms.	57°30′	8°53′	» »	IV	♂	28	33	living
		28	1034	NW of Hirshals. 23 fms.	57°40′	9°43′	» »	IV	♂	28·5	33·5	living
		31	1003	Off Tversted. 16 fms.	57°43′	10°09′	» »	IV	♂	30	33·5	fresh
	» »		1068	The Limfjord.			» Fishingb.	IV	♀	30·5		
	» August	2	708	N by E of Hanstholm. 32 fms.	57°28′	8°36′	» S. B.	V	♀	30	34	living
	» »	2	790	WNW of Hirshals. 23 fms.	57°38′	9°34′	» »	V	♂	25·5	28	living
		2	792	NNW of Hirsholmene. 15 fms.	57°40′	9°50′	» »	V	♂	27	31	living
		10	830	E of Hirsholmene. 15 fms.	57°30′	10°42′	» »	V	♀	25·5	27	living
		11	936	E of Skagen. 31 fms.	57°48′	10°47′	» »	V	♂	30	33·5	living
	» »	12	1087	24 miles NW of Hirshals. 30 fms.	57°46′	9°25′	Dan. Fishingb.	V	♀	27·5	31	
	» »	17	920	N of Trindelen. 19 fms.	57°30′	11°15′	» S. B.	V	♂	29	30	living
		19	722	57°30′ N 8°35′ E. 36 fms.	57°30′	8°35′	English S. T.	V	♂	26	32·5	
		25	942	Off Hirshals. 25 fms.	57°40′	9°47′	Danish S. B.	V	♂	24	27	rotten
		25	1133	NNE of Hanstholm. 26 fms.	57°29′	8°44′	» »	V	♂	28	32·5	fresh
	» »	31	1015	NW of Hirshals. 20 fms.	57°39′	9°45′	» »	V	♂	27	[25]	rotten
	» Septbr.	2	985	S of Skagen. 8 fms.	57°42′	10°38′	» Fishingb.	VI	♂	27·5	32	fresh
	» »	7	612	Off Tversted. 20 fms.	57°43′	10°07′	» S. B.	VI	♀	24·5	33·5	fresh
	» »	10	746	56°50′ N 6°20′ E. 28 fms.	56°50′	6°20′	English S. S.	VI	♀	29	33	fresh
		10	947	Pakhus Bay. 8 fms.	56°42′	11°36′	Danish S. B.	VI	♀	28		
	»	13	926	56°40′ N 7°00′ E. 21 fms.	56°40′	7°00′	English S. T.	VI	♀	28	34	fresh
	» »	15	850	At Hanstholm.	57°10′	8°30′	» »	VI	♂	25	29·5	fresh
	» »	23	625	N of Hanstholm Light, 24 miles fr. shore. 40 fms.	57°29′	8°26′	Danish S. B.	VI	♂	29	34·5	tail dry
	» »	29	1032	Hanstholm bearing SSW. 30 fms.	57°30′	8°44′	» »	VI	♀	28·5	34	a little dry
	October	15	895	Skagerak, off Skiveren. 4 fms.	57°38′	10°16′	» »	VII	♀	30	36	fresh
		30	664	NNW of Skagen. 80 fms.	58°04′	10°13′	German S. S	VII	♀	29	35	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery											
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 22. Off Bulbjerg—Svinkleven, Skagerak. 57°12′—57°18′ N 9°09′—9°17′ E. 10—16 meters. 575 Plaice liberated (No. 601—1175). "Thor"'s marking experiment No. 4 1905	1905 Novbr. 9	966	16 miles NNW of Slugen N 12 fms.	55°46′	7°30′	Danish S. B.	VIII	♀	28·5	36·5	
	» Decbr. 9	1105	N of Skagen. 10 fms.	57°45′	10°35′	» Fishingb.	IX	♀	27	39	fresh
	1906 Jan. 9	782	Off Kandestederne. 4 fms.	57°40′	10°21′	» S. B.	X	♀	26·5	31	fresh
	» » 31	922	Skagen's Light-ship.	57°46′	10°44′	» Fishingb.	X	♂	29		
	» Febr. 18	900	56°58′ N 6°45′ E. 23 fms.	56°58′	6°45′	English S. T.	XI	♀	30	35	dried and salted
	» » 27	1130	8 miles E of Skagen. 28 fms	57°47′	10°53′	Swedish S. T.	XI	♂	27·5	33	
	» April 9	606	NW of Hirshals. 17 fms.	57°38′	9°46′	Danish S. B.	XIII	♀	27·5	35·5	living
	» » 30	699	NW of Hirshals. 20 fms.	57°40′	9°45′	» »	XIII	♀	28	36	living
	» » 30	903	16 miles SW of Graadyb. 10 fms.	55°13′	7°58′	» »	XIII	♂	25·5	31·5	
1905. March 24. 3 miles W of TorupBn., North Sea. 56°58′ N 8°18′ E. 18 meters. "Thor" St. 354. 40 Plaice liber. (No. 1201—1240). "Thor"'s marking experiment No. 5 1905.	1905 March 26	1205	Off Thyborøn Canal. 1 mile from shore.	56°43′	8°11′	Dan. Fishingb.	0	♂	26·5	25	dry
	» April 10	1222	2 miles E of Thyborøn Canal.	56°43′	8°14′	» »	I	♀	28·5	27·5	
	» » 24	1221	Off Husby. 1/8 mile from shore.	56°11′	8°06′	» »	I	♀	25	25	
	» » 27	1224	1 mile S of Cancer. 8 fms.	55°28′	8°03′	» S. B.	I	♂	25·5	25·5	
	» May 15	1231	Off Helligsødal, Nissum Bredning.	56°42′	8°18′	» Fishingb.	II	♀	23	24	
	» June 7	1203	8 miles WSW of Vyl Light-ship. 10 fms.			» S. B.	III	♀	30·5	31·5	
	» » 9	1230	1 mile S of Thyborøn Canal, close to shore. 6 fm.	56°41′	8°10′	» »	III	♂	25·5	27	
	» » 11	1238	2 miles W of Nymindegab. 8 fms.	55°47′	8°06′	» »	III	♂	29	30·5	
	» » 12	1214	N of Esbjerg Light (?). 7 fms.			» »	III	♂	23	24·5	
	» July 13	1224	SW of Bovbjerg. 14 fms.	56°19′	7°54′	» »	IV	♂	29	33·5	
	» » 14	1217	20 miles NW of Rubjerg Knude. 18 fms.	57°39′	9°17′	» »	IV	♀	27	29·5	
	» » 16	1235	57°20′ N 7°30′ E.	57°20′	7°30′	English S. T.	IV	♀	31·5	34*	* *fide* agent
	» Aug. 24	1215	57°28′ N 8°27′ E.	57°28′	8°27′	German S. T.	V	♀	32	35	
	1906 Jan. 6	1228	56°10′ N 5°30′ E. 29 fms.	56°10′	5°30′	English S. T.	X	♂	24	30·5	
1905. March 29. 5 miles N 1/2 W of Hirsholmene, Kattegat. 57°34′ N 10°35′ E. 16 meters. "Thor" St. 359. 300 Plaice liber. (No. 1241—1540). "Thor"'s marking experiment No. 6 1905.	1905 April 1	1241	E of Aalbæk. 8 fms.	57°37′	10°34′	Dan. Fishingb.	I	♂	27·5	27·5	
	» » 1	1253	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♀	29·5	29	
	» » 1	1256	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♀	22·5	20	
	» » 1	1260	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♀	23·5	23	
	» » 1	1264	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♀	26	25	
	» » 1	1288	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♂	28	27·5	
	» » 1	1300	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♂	22·5	20	
	» » 1	1310	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♀	24·5	24	
	» » 1	1315	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♀	25	24	mature
	» » 1	1363	E of Aalbæk. 8 fms.	57°37′	10°34′	» S. B.	I	♂	29·5	29	
	» » 1	1374	E of Hulsig. 6 fms.	57°40′	10°33′	» »	I	♂	32	31	
	» » 4	1246	Off Jerup. 3 fms.	57°33′	10°29′	» Fishingb.	I	♀	26	25·5	
	» » 4	1255	S of Skagen's old church. 7 fms.	57°41′	10°35′	» »	I	♂	22	21·5	
	» » 4	1263	E of Aalbæk. 8 fms.	57°37′	10°34′	» »	I	♀	29·9	29	
	» » 4	1275	S of Skagens old church. 7 fms.	57°41′	10°35′	» »	I	♂	29	27·5	
	» » 4	1289	S of Skagen, off Fyrbakken. 5 fms.	57°43′	10°37′	» »	I	♂	23·5	23	mature
	» » 4	1353	S of Skagen's old church. 5 fms.	57°42′	10°34′	» »	I	♂	22·5	22	
	» » 4	1365	Skagen's old church bearing NE. 4 fms.	57°42′	10°35′	» »	I	♂	25	24·5	
	» » 4	1442	SE of Skagen's old church. 5 fms.	57°42′	10°34′	» »	I	♂	26	25	
	» » 4	1449	Off Jerup. 3 fms.	57°33′	10°29′	» »	I	♀	26·5	26·5	
	» » 4	1454	S of Skagen's old church. 5 fms.	57°42′	10°34′	» »	I	♀	28·5	28	
	» » 4	1491	Skagen's Light bearing NE. 6 fms.	57°42′	10°34′	» »	I	♀	24·5	24	
	» » 5	1282	SW of Skagen's Light. 8 fms.	57°42′	10°36′	» S. B.	I	♀	24	24	
	» » 5	1287	Aalbæk Bay. 6 fms.			» »	I	♂	24·5	24·5	
	» » 5	1291	E of Aalbæk. 8 fms.	57°37′	10°34′	» Fishingb.	I	♀	26·5	26·5	
	» » 5	1331	2 miles S of Skagen. 8 fms.	57°42′	10°37′	» »	I	♂	26	25·5	
	» » 5	1356	Aalbæk Bay. 6 fms.			» S. B.	I	♀	24·5	24	dead and rotten when caught
	» » 5	1386	2 miles S of Skagen. 8 fms.	57°42′	10°37′	» Fishingb.	I	♀	27		
	» » 5	1404	SW of Skagen's Light. 8 fms.	57°42′	10°36′	» S. B.	I	♂	22·5	22	dead and rotten when caught
	» » 5	1420	SW of Skagen's Light. 8 fms.	57°42′	10°36′	» »	I	♂	22		
	» » 5	1428	Aalbæk Bay at the Corals. 10 fms.	57°33′	10°36′	» »	I	♀	28·5	28·5	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date		No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 29. 5 miles N ½ W of Hirsholmene, Kattegat. 57°34′ N 10°35′ E. 16 meters. "Thor" St. 359. 300 Plaice liber. (No.1241—1540). "Thor"s marking experiment No. 6 1905.	1905 April	5	1531	SW of Skagen's Light. 8 fms.	57°42′	10°36′	Danish S. B.	I	♂	23	22·5	
	»	6	1248	S of Skagen's old church. 5 fms.	57°42′	10°34′	» Fishingb.	I	♂	26	25	
	»	6	1250	1 mile W of Skagen. 4 fms.	57°42′	10°35′	» »	I	♂	27·5	27	
		6	1258	Skagen's Light bearing NE. 6 fms.	57°42′	10°35′	» »	I	♀	27	25·5	
		6	1332	1 mile W of Skagen. 4 fms.	57°42′	10°35′	» »	I	♂	22	21	
	»	6	1355	Skagen's Light bearing N by E. 5 fms.	57°43′	10°38′	» »	I	♀	32	31	
	»	6	1383	S of Skagen. 6 fms.	57°43′	10°38′	» S. B.	I	♂	25·5	25	
	»	6	1430	Aalbæk Bay. 3 fms.			» »	I	♂	32·5	32	
		6	1445	Skagen's Light bearing SE. 7 fms.	57°45′	10°35′	» Fishingb.	I	♀	30	29	
	»	6	1483	Skagen's Light bearing N by E. 6 fms.	57°43′	10°39′	» »	I	♂	29·5	29	
	»	7	1330	S of Skagen's old church. 6 fms.	57°42′	10°34′	» »	I	♂	24	23·5	
		8	1266	S of Skagen's old church. 8—9 fms.	57°38′	10°36′	» »	I	♀	27	27	
		8	1270	S of Skagen's old church. 8—9 fms.	57°38′	10°36′	» »	I	♀	29	29	
	»	8	1301	S of Skagen's old church. 8—9 fms.	57°38′	10°36′	» »	I	♀	30	30	
		8	1302	S of Skagen's old church. 8—9 fms.	57°38′	10°36′	» »	I	♀	26·5	26·5	
	»	8	1347	S of Skagen's old church. 8—9 fms.	57°38′	10°36′	» »	I	♀	26	25·5	
	»	8	1354	S of Skagen's old church. 8—9 fms.	57°38′	10°36′	» »	I	♂	29·5	29·5	
	»	8	1421	S of Skagen's old church. 8—9 fms.	57°38′	10°36′	» »	I	♂	26	26	
	»	8	1468	Hertha's Flak. 13 fms			» »	I	♀	29·5	29·5	
		10	1311	S of Skagen's old church. 13 fms.	57°37′	10°40′	» S. B.	I	♀	26·5	26·5	
	»	10	1321				» Fishingb.	I	♂	26	25·5	
	»	10	1341	S of Skagen. 8 fms.	57°41′	10°36′	» »	I	♂	26	25·5	
	»	10	1368	S of Fyrbakken, Skagen. 8 fms.	57°41′	10°39′	» »	I	♂	24·5	23·5	
	»	10	1427	Skagen's Light bearing S by E. 6 fms.	57°45′	10°37′	» »	I	♀	28·5	27	
	»	10	1447	S of Østerby, Skagen. 7 fms.	57°43′	10°37′	» »	I	♀	27·5	26·5	
	»	10	1492	SE of Skagen. 13 fms.	57°42′	10°45′	» S. B.	I	♀	27·5	27	
		11	1242	Aalbæk Bay. 8 fms.			» Fishingb.	I	♂	30·5	31	
		11	1318	4 miles N of Hirsholmene. 7 fms.	57°34′	10°34′	» S. B.	I	♀	23·5	23	
		11	1328	Aalbæk Bay. 8 fms.			» Fishingb.	I	♀	31	31·5	
	»	11	1345	1½ mile W of Skagen. 7 fms.	57°41′	10°35′	» »	I	♀	23	22·5	
	»	11	1372	S of Skagen's old church. 6 fms.	57°41′	10°34′	» »	I	♀	30	29·5	
	»	11	1375	S of Skagen's old church. 6 fms.	57°41′	10°34′	» »	I	♀	25	23·5	
	»	11	1407	S of Skagen's old church. 7 fms.	57°41′	10°35′	» »	I	♀	33	32	
	»	11	1538	1½ mile W of Skagen. 7 fms.	57°41′	10°35′	» »	I	♀	24	23·5	
		12	1245	Off Aalbæk. 3 fms.	57°36′	10°27′	» »	I	♂	23	22	
		12	1459	Off Klitlund. 3 fms.	57°36′	10°27′	» »	I	♀	25·5	24·5	
	»	13	1312	NE of Aalbæk. 7½ fms.	57°39′	10°35′	» »	I	♂	25·5	25	
		18	1450	E of Skagen's Light. 15 fms	57°45′	10°45′	» »	I	♀	30	29	
		18	1457	Aalbæk Bay. 8 fms.			» »	I	♀	31	31	
	»	23	1276	Off Skagen. 5 fms.	57°42′	10°35′	» »	I	♀	26·5	27	
	»	24	1479	Off Skagen. 5 fms.	57°42′	10°35′	» »	I	♀	25	24·5	
	»	25	1370	S of Skagen's old church. 5 fms.	57°42′	10°34′	» »	I	♀	25	24·5	
	»	25	1410	S of Skagen's old church. 6 fms.	57°41′	10°34′	» »	I	♀	25	24·5	
	»	25	1433	SW of Skagen's Light. 6 fms.	57°40′	10°34′	» »	I	♀	25	24·5	somewh. dry
	»	26	1443	Aalbæk Bay. 8 fms.			» S. B.	I	♀	24	24	
		27	1249	Aalbæk Bay. 8 fms.			» »	I	♂	26	26	
		27	1279	Aalbæk Bay. 4 fms.			» Fishingb.	I	♀	27·5	27	
		27	1309	Aalbæk Bay. 7 fms.			» »	I	♂	25·5	26	
		27	1346	Aalbæk Bay. 8 fms.			» »	I	♀	29	29·5	
	»	27	1358	Aalbæk Bay. 7 fms.			» S. B.	I	♂	25·5	26	
		27	1460	Aalbæk Bay. 8 fms.			» Fishingb.	I	♂	28·5	29	
	»	30	1285	S of Skagen's old church. 5 fms.	57°42′	10°35′	» »	I	♀	29	29	a little dry
	»	30	1485	Aalbæk Bay. 7 fms.			» »	I	♂	25	26	
	May	1	1344	NE of the Flak, Skagen's Light bear. NW. 16 fm.	57°43′	10°51′	» S. B.	II	♂	33	33	
		2	1251	SW of Skagen's Light. 8 fms.	57°41′	10°36′	» »	II	♀	25·5		
		2	1273	Aalbæk Bay. 8 fms.			» Fishingb.	II	♂	26	27	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 29. 5 miles N ½ W of Hirsholmene, Kattegat. 57°34′ N 10°35′ E. 16 meters. "Thor" St. 359. 300 Plaice liber. (No.1241 – 1540). "Thor"s marking experiment No. 6 1905.	1905 May 2	1290	Aalbæk Bay.			Dan. Fishingb.	II	♀	22	22	
	» » 2	1342	Aalbæk Bay.			» »	II	♂	25	25·5	
	» » 2	1466	N of Nordre Rønner, Læsø. 6 fms.	57°24′	10°54′	» S. B.	II	♂	25·5	25·5	
	» » 2	1504	Aalbæk Bay. 8 fms.			» Fishingb.	II	♂	26·5	26	
	» » 2	1510	Aalbæk Bay. 8 fms.			» »	II	♀	30	29·5	
	» » 3	1325	Skagen's old church bearing NE. 5 fms.	57°42′	10°35′	» »	II	♂	22	22	
	» » 3	1362	Aalbæk Bay. 8 fms.			» »	II	♀	23	23	
	» » 4	1274	SE of Skagen's Light. 6 fms.	57°43′	10°39′	» »	II	♂	28·5	29	tail dry
	» » 4	1429	Aalbæk Bay, 1 mile from shore. 4 fms.			Swedish S. B.	II	♂	23·5	23·5	
	» » 5	1268	S of Skagen. 10 fms.	57°41′	10°39′	Dan. Fishingb.	II	♀	26	26	
	» » 5	1340	Hirshalsrende. 10 fms.			» S. B.	II	♂	23	24	
	» » 5	1403	Skagen's Light bearing NW. 6 fms.	57°43′	10°39′	» Fishingb.	II	♀	22·5	22	
	» » 5	1444	S of Skagen's Light. 6 fms.	57°43′	10°39′	» »	II	♀	24	24	
	» » 6	1267	Aalbæk Bay. 8 fms.			» »	II	♀	27·5	27·5	
	» » 6	1283	Aalbæk Bay. 8 fms.			» »	II	♀	24·5	25	
	» » 6	1295	Aalbæk Bay. 8 fms.			» »	II	♀	25	24·5	
	» » 6	1303	Aalbæk Bay. 8 fms.			» »	II	♀	23	23	
	» » 6	1338	Aalbæk Bay. 7 fms.			» »	II	♂	30	31	
	» » 6	1359	Aalbæk Bay. 11 fms.			» »	II	♀	22	21·5	
	» » 6	1377	Aalbæk Bay.			» »	II	♀	28	29	
	» » 6	1381	Aalbæk Bay. 8 fms.			» »	II	♂	23·5	24	
	» » 10	1257	Aalbæk Bay. 8 fms.			» »	II	♂	22	22	
	» » 11	1401	S of Skagen. 5 fms.	57°42′	10°35′	» »	II	♂	29	29	
	» » 13	1308	1 mile N of Græsholmene. 4 fms.	57°31′	10°34′	» »	II	♂	24		
	» » 13	1306	Aalbæk Bay. 7 fms.			» »	II	♀	22·5	23	
	» » 13	1348	Skagen's Light bearing SW. 6 fms.	57°45′	10°39′	» »	II	♀	29·5	30·5	tail dry
	» » 13	1448	Off Bulbjerg. 30 fms.	57°37′	8°59′	» »	II	♂	29	28·5	
	» » 15	1252	Aalbæk Bay. 8 fms.			» »	II	♀	28	28·5	
	» » 15	1437	1 mile NW of Løkken.	57°23′	9°41′	» »	II	♀	28·5	29·5	tail dry
	» » 16	1292	S of Skagen's old church. 10 fms.	57°37′	10°37′	» »	II	♀	24·5	25·5	tail dry
	» » 16	1297	S of Skagen. 6 fms.	57°42′	10°35′	» »	II	♀	27	26·5	tail dry
	» » 16	1350	S of Skagen's old church. 10 fms.	57°37′	10°37′	» »	II	♀	25·5	26·5	tail dry
	» » 16	1418	6 miles NE of Frederikshavn. 6 fms.	57°31′	10°35′	Swedish S. B.	II	♀	28·5	29·5	
	» » 17	1243	S of Skagen. 7 fms.	57°41′	10°37′	Dan. Fishingb.	II	♀	26	27	
	» » 17	1413	Store Grund, N of Læsø.			» »	II	♂	23	24	
	» » 17	1532	Store Grund, N of Læsø.			» »	II	♂	25·5	23·5	
	» » 18	1314	Off Aalbæk. 6 fms.	57°35′	10°32′	» »	II	♀	23	23·5	
	» » 18	1337	Off Aalbæk. 6 fms.	57°35′	10°32′	» »	II	♀	27·5	27·5	
	» » 20	1334	Aalbæk Bay. 8 fms.			» »	II	♂	26·5	26	
	» » 20	1349	Aalbæk Bay. 8 fms.			» »	II	♀	25	25	
	» » 24	1520	SE of Sæby, 4 fms.	57°18′	10°37′	» S. B.	II	♀	25	24·5	
	» » 25	1360	Aalbæk Bay. 8 fms.			» Fishingb.	II	♀	22·5	22	
	» » 27	1271	Aalbæk Bay. 3 fms.			» »	II	♀	28	[25·5]	
	» » 27	1364	SE brush-buoy, Skagen. 6 fms.	57°44′	10°41′	» »	II	♀	26	27·5	
	» » 27	1494	E of Sæby harbour, 5 miles from shore. 9 fms.	57°21′	10°41′	» »	II	♂	29·5	29·5	
	» » 30	1261	8 miles NE of Frederikshavn. 6 fms.			Swedish S. B.	II	♀	27	27	
	» » 30	1336	S of Skagen's old church. 8 fms.	57°38′	10°36′	Dan. Fishingb.	II	♂	27	28·5	
	» » 30	1525	Skagen's Light bearing NE. 8 fms.	57°43′	10°40′	» »	II	♂	28	28	
	» June 2	1366	E of Aalbæk. 9 fms.	57°37′	10°36′	» »	III	♂	23	23	
	» » 2	1452	E of Aalbæk. 9 fms.	57°37′	10°36′	» »	III	♂	24·5	24·5	
	» » 5	1272	NE of Aalbæk. 7 fms.	57°40′	10°35′	» »	III	♂	27·5	29·5	
	» » 5	1335	Skagen, off Sandmilen. 6 fms.	57°42′	10°33′	» »	III	♂	22·5	24·5	fresh
	» » 5	1387	Skagen, off Sandmilen. 4 fms.	57°42′	10°33′	» »	III	♂	25·5	28·5	fresh
	» » 5	1486	At the harbour of Skagen. 5 fms.	57°43′	10°36′	» »	III	♀	24	24·5	fresh
	» » 6	1265	Skagen, off Sandmilen. 5 fms.	57°42′	10°33′	» »	III	♂	26	26	
	» » 7	1333	Off Hulsig. 8 fms.	57°38′	10°35′	» »	III	♂	22	22·5	fresh

Table 20. Continued

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery											
	Date	Nr. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. March 29. 5 miles N ½ W of Hirsholmene, Kattegat. 57°34′ N 10°35′ E. 16 meters. "Thor" St. 359. 300 Plaice liber. (No.1241—1540). "Thor"s marking experiment No. 6 1905.	1905 June 8	1280	Off Hulsig. 8 fms.	57°38′	10°35′	Dan. Fishingb.	III	♀	29	29·5	fresh
	» » 8	1512	S of Skagen. 10 fms.	57°41′	10°39′	» »	III	♀	28	29·5	fresh
	» » 9	1296	Skagen, off Sandmilen.	57°42′	10°33′	» »	III	♀	22	[21]	fresh
	» » 9	1497	N of Nordre Rønner, Læsø. 7 fms.	57°24′	10°53′	» »	III	♂	24	23·5	
	» » 13	1343	Off Aalbæk. 9 fms.	57°36′	10°36′	» »	III	♂	24	25	
	» » 17	1269	Off Aalbæk. 9 fms.	57°36′	10°36′	» »	III	♀	26	24·5	
	» » 17	1352	NE of Holmene. 13 fms.	57°36′	10°44′	» »	III	♂	24	25·5	
	» » 20	1391	S of Skagen. 7 fms.	57°41′	10°37′	» »	III	♂	23·5	26	
	» » 26	1293	Off Skagen. 9—10 fms.	57°41′	10°39′	» »	III	♂	24·5	23	
	» » 28	1259	S of Skagen. 5 fms.	57°42′	10°35′	» »	III	♂	22·5	21·5	
	» » 28	1262	Skagen, off Sandmilen. 6 fms.	57°42′	10°33′	» »	III	♀	29·5	29	
	July 2	1313	E of Aalbæk. 8 fms.	57°37′	10°34′	» S. B.	IV	♀	25	24·5	
	» » 2	1326	S of Skagens Reef, off Stokmilen.	57°43′	10°40′	» Fishingb.	IV	♀	22·5	24	half dry
	» » 3	1284	S of Skagen. 5 fms.	57°42′	10°35′	» »	IV	♂	22·5	24·5	
	» » 3	1320	Aalbæk Bay. 8 fms.			» »	IV	♀	24	28	
	» » 3	1322	S of Skagen, off Sandmilen. 5 fms.	57°42′	10°33′	» »	IV	♀	23·5	25·5	
	» » 3	1521	57°50′ N 10°57′ E. 20 fms.	57°50′	10°57′	English S. T.	IV	♀	28·5	28·5	dried and salted
	» » 13	1501	Betw. Skagen and Hirsholmene. 6 m. fr. sh. 12 f.	57°36′	10°40′	Swedish S.B.	IV	♂	28	30	
	» » 18	1446	S of Skagen. 6 fms.	57°42′	10°35′	Dan. Fishingb.	IV	♂	24·5	27	fresh
	» » 31	1477	2 miles E of Trindelen's Light-ship. 22 fms.	57°26′	11°20′	» S. B.	IV	♂	29·5	29·5	fresh
	» August 1	1247	N of Kandestederne. 6 fms.	57°41′	10°23′	» Fishingb.	V	♀	22·5	23	half dry
	» » 2	1351	NE of Aalbæk.			» »	V	♂	27	27·5	fresh
	» » 7	1319	NW of Skagen's Light. 13 fms.	57°45′	10°34′	» S. B.	V	♂	24	[23]	living
	» » 17	1500	6 miles SE of Skagen. 13 fms.	57°40′	10°47′	Swedish »	V	♂	24·5	23·5	
	» Octbr. 4	1307	Off Kandestederne. 4 fms.	57°41′	10°23′	Danish »	VII	♀	23	29	fresh
	1906 Jan. 1	1498	S of Knallen's brush-buoy, Læsø.	57°18′	11°16′	» Fishingb.	X	♂	30	34·5	living
	» » 15	1299	N of Skagen. 25 fms.	57°46′	10°35′	» »	X	♀	29·5	33	fresh
	» May 20	1294	NW of Blokhus. 6 fms.	57°17′	9°31′	» S. B.	XIV	♂	23	26·5	
1905. April 1. 12 miles SSE of Hals Light-ship, Kattegat. 56°48′ N 10°35 E. 9 meters. "Thor" St. 361. 100 Plaice liber. (No.1541—1640). "Thor"s marking experiment No. 7 1905.	1905 April 15	1544	"Havdyb" S of Limfjord.	56°58′	10°21′	Dan. Fishingb.	0	♀	33	31	dry
	» May 5	1589	Aalbæk Bay. 7 fms.			» »	I	♀	23·5	26	
	» » 26	1621	8 miles E of Hals. 7 fms.	56°58′	10°36′	Swedish S.B.	I	♂	22	23	
	» June 3	1596	Aalborg Bay. 7 fms.			» »	II	♀	23·5	23·5	
	» » 6	1605	Aalborg Bay, 24 m. SW of Kobbergrund. 7½ f.	56°49′	10°58′	» »	II	♀	27·5	30	
	» » 7	1620	Aalborg Bay. 7½ fms.			» »	II	♀	24	25	
	» » 7	1638	Aalborg Bay. 7½ fms.			» »	II	♀	27·5	28	
	» » 8	1573	12 miles NW from Tangen's Light-buoy. 7½ f.	56°46′	10°41′	» »	II	♀	25·5	27	
	» » 15	1568	Aalborg Bay, 16 miles from shore. 7½ fms.	56°50′	10°48′	» »	II	♂	26·5	28·5	
	» » 15	1634	Aalborg Bay, 16 miles from shore. 7 fms.	56°49′	10°48′	» »	II	♂	27	28	
	16	1630	8 miles N of Læsø. 14 fms.	57°27′	11°03′	» »	II	♂	23·5	25·5	
	» » 29	1565	4 miles N of Grenaa. 7 fms.	56°29′	10°58′	» »	II	♂	23·5	25	
	» » 29	1625	4 miles N of Grenaa. 7 fms.	56°29′	10°58′	» »	II	♂	24	27·5	
	» July 5	1588	Aalborg Bay, 12 miles from shore 7 fms.	56°47′	10°40′	» »	III	♀	25	29·5	
	» 9	1623	12 miles N of Staunshoved.	56°44′	10°43′	Danish »	III	♂	26·5	29	somewh. dry
	» 11	1598	Aalborg Bay. 7 fms.			Swedish »	III	♂	23·5	26	
	» 11	1613	Aalborg Bay. 7 fms.			» »	III	♀	26	28·5	
	» » 13	1583	Aalborg Bay. 7½ fms.			» »	III	♀	23·5	26·5	
	28	1567	8 miles NW of Anholt. 9 fms.	56°47′	11°18′	» »	III	♀	27	30	
	» 28	1571	E of Sæby. 10 fms.	57°21′	10°43′	Danish »	III	♀	27	31·5	fresh
	28	1584	6 miles NE of Tangen's Light-buoy.	56°45′	11°05′	» »	III	♀	26	30	
	» » 28	1614	S of the NW Reef, Læsø. 15 fms.	57°16′	10°46′	» »	III	♀	29	31	fresh
	» August 2	1563	Store Kobbergrund. 9 fms.	57°11′	11°19′	Swedish »	IV	♀	27	32·5	
	» » 8	1627	E of Læsø. 8 fms.	57°18′	11°15′	Danish »	IV	♂	26·5	30	living
	» » 10	1622	Skagen's Light bearing SW. 15 fms.	57°46′	10°41′	» »	IV	♂	28	31·5	fresh
	» » 11	1570	Anholt Light bearing ESE. 10 fms.	56°47′	11°14′	» »	IV	♀	23·5	25·5	dry

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. April 1. 12 miles SSE of Hals Light-ship, Kattegat. 56°48′ N 10°35′ E. 9 meters. "Thor" St. 361. 100 Plaice liber. (No.1541—1640). "Thor"s marking experiment No. 7 1905.	1905 Aug. 13	1600	Aalborg Bay. 6 fms.			Danish S. B.	IV	♀	25	25	
	» » 14	1629	W of Nordbjerg, Anholt, 6 miles fr. shore. 9 fm.	56°42′	11°18′	» »	IV	♀	22·5	27	tail dry
	» » 17	1618	12 miles NW of Anholt. 9 fms.	56°49′	11°13′	» »	IV	♂	24·5	25	dry
	» » 20	1580	Outermost buoy, NW Reef, Anholt. 10 fms.	56°48′	11°21′	» »	IV	♀	24·5	26	somewh. dry
	» » 25	1590	2 m. NE of the outerm. buoy, NW Reef, Anh. 9 fm.	56°50′	11°21′	» »	IV	♀	26·5	29·5	dry
	» Sept. 1	1592	8 miles SW of Anholt. 14 fms.	56°34′	11°28′	» »	V	♀	32		
	» » 14	1615	Skagen's Light bearing SE. 10 fms.	57°45′	10°35′	» Fishingb.	V	♂	25	31	fresh
	» » 14	1603	8 miles W of Anholt.	56°41′	11°18′	» S. B.	V	♀	26·5	29	dry
	» » 21	1636	NNW of Anholt. 7 fms.	56°54′	11°23′	» »	V	♀	27·5	[21·5]	fresh
	» » 22	1611	16 miles S of Læsø Rende Light-ship. 6½ fms.	56°58′	10°49′	» »	V	♀	24·5	32	fresh
	» Octbr. 12	1635	8 miles E of Hirsholmene. 14 fms.	57°35′	10°49′	» »	VI	♀	30	33	fresh
	» » 12	1561	SE of Hals. 7 fms.	56°54′	10°31′	» »	VI	♀	22·5	28·5	fresh
	» »	1637	S by W of Kobbergrund. 10 fms.	57°04′	11°28′	» »	VI	♂	26	31	
	» Novbr. 9	1566	Off Højen. 6 fms.	57°44′	10°30′	» Fishingb.	VII	♀	33	35·5	fresh
	1906 Jan. 6	1579	N of Skagen. 8 fms.	57°45′	10°37′	» »	IX	♀	26	33·5	fresh
	» » 25	1604	6 miles SSW of Anholt Light.	56°39′	11°37′	German S. T.	IX	♀	23·5	30	fresh
	» » 27	1569	N of Skagen. 15 fms.	57°46′	10°37′	Dan. Fishingb.	IX	♂	25·5	30·5	fresh
	» » 28	1631	8 miles SW of Anholt. 13 fms.	56°35′	11°25′	Danish S. B.	IX	♀	23·5	28	mature / fresh
	» Febr. 15	1608	8 miles NW of Lysegrund.	56°23′	11°36′	» »	X	♀	23·5	30	
	» » 18	1624	Off Højen. 3 fms.	57°44′	10°30′	» Fishingb.	X	♂	25·5	31·5	fresh
	» March 17	1617	Anholt bearing N by W. 10 miles distant.	56°34′	11°47′	German S. S.	XI	♀	23·5	27	
	» April 2	1616	6 miles SW of Anholt. 14 fms.	56°35′	11°30′	Dan. Fishingb.	XII	♀	25	33·5	fresh
	» » 25	1602	W of Læsø harbour. 5 fms.	57°19′	10°48′	Danish S. B.	XII	♀	26·5	35·5	
	» June 16	1595	Aalborg Bay, 16 miles from shore. 7 fms.	56°49′	10°48′	Swedish »	XIV	♀	22	28·5	
1905. April 15. 8 miles SSW of BlaavandsPoint, North Sea. 55°26′N 8°02′E. 14 meters. "Thor" St. 381. 200 Plaice liber. (No.1641—1840). "Thor"s marking experiment No. 8 1905.	1905 April 17	1641	2 miles SSW of Cancer. 9 fms.	55°26′	8°02′	Danish S. B.	0	♂	27·5	27·5	
	» » 17	1652	2 miles SSW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	23	22·5	
	» » 17	1666	½ mile SSW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	26	26	
	» » 17	1677	2 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	23·5	23·5	
	» » 17	1690	2 miles SSW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	26	25·5	
	» » 17	1692	2 miles SW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♀	27	27	
	» » 17	1700	2 miles SW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	27·5	27·5	
	» » 17	1708	2 miles SW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	24	24	
	» » 17	1733	3 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	26	25·5	
	» » 17	1755	2 miles SW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	25·5	25·5	
	» » 17	1835	3 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	24	23	
	» » 18	1647	1 mile SW of Cancer. 6 fms.	55°28′	8°01′	» »	0	♂	25	25	
	» » 18	1653	2 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	27	27	
	» » 18	1793	1 mile SW of Cancer. 6 fms.	55°28′	8°01′	» »	0	♀	23	23	
	» » 18	1815	1 mile SW of Cancer. 6 fms.	55°28′	8°01′	» »	0	♂	29	28·5	
	» » 19	1665	2 miles WNW of Graadeep. 7½ fms.	55°26′	8°11′	» »	0	♂	25	24	
	» » 19	1669	2 miles WNW of Graadeep. 7½ fms.	55°26′	8°11′	» »	0	♂	27	27	
	» » 19	1717	2 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	28	27·5	
	» » 19	1720	2 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	25	25	
	» » 19	1735	4 miles ESE of Cancer. 7 fms.	55°28′	8°08′	» »	0	♀	24	23·5	
	» » 19	1751	2 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	26·5	26	
	» » 19	1803	2 miles WNW of Graadeep. 7½ fms.	55°26′	8°10′	» »	0	♀	26·5	26·5	
	» » 20	1645	1 mile S of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	27·5	27	
	» » 20	1646	2 miles SSW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	26	25·5	
	» » 20	1650	1 mile S of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	25	24·5	
	» » 20	1660	¼ mile SSW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	25·5	25	
	» » 20	1709	3 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	27	26·5	
	» » 20	1712	2 miles SSW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♂	25	24·5	
	» » 20	1716	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	27·5	27	
	» » 20	1718	1 mile NE of Vyl Light-ship. 12 fms.	55°25′	7°46′	» »	0	♂	26	25·5	

Table 20. Continued

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date		No on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. April 15. 8 miles SSW of BlaavandsPoint, North Sea. 55°26′N 8°02′E. 14 meters. "Thor" St. 381. 200 Plaice liber. (No.1641—1840). "Thor"'s marking experiment No. 8 1905.	1905 April	20	1744	2 miles E of Vyl Light-ship. 8 fms.	55°24′	7°54′	Danish S. B.	0	♂	24·5	23·5	
		20	1760	4 miles WSW of Graadeep. 8 fms.	55°24′	8°09′	» »	0	♀	24	24	
		20	1806	1 mile SSW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	27	27	
		20	1819	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	26·5	26·5	
		21	1648	1 mile SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	25·5	25	
		21	1817	1 mile SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	25·5	24·5	
		22	1672	3/4 mile N by E of Graadeep. 6 fms.	55°27′	8°13′	» »	0	♂	28	28	
		27	1729	4 miles SW of Blaavand. 8 fms.	55°30′	8°03′	» »	0	♂	26	26	
		27	1730	2 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	29·5	30	
		27	1732	4 1/2 miles W by N of Vyl Light-ship. 11 fms.	55°24′	7°37′	» »	0	♂	25	25	
		27	1736	1 mile S of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	27·5	27·5	
		27	1742	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	27	27·5	
		27	1745	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	25·5	25	
		27	1752	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	23	22·5	
		27	1771	1 mile S of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	25	25	
		27	1772	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	27·5	27	
		27	1790	4 1/2 miles W by N of Vyl Light-ship. 11 fms.	55°24′	7°37′	» »	0	♀	24	24	
		27	1792	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	27	26·5	
		27	1822	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	23·5	23	
		28	1667	2 miles S of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	26		
		28	1680	1 mile SW of Cancer. 7 1/2 fms.	55°26′	8°02′	» »	0	♂	29	28·5	
		28	1688	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	26	25·5	
		28	1713	1 mile SE of Vyl buoy. 9 fms.	55°26′	7°52′	» »	0	♂	27·5	27	
		28	1721	1 mile SW of Cancer. 7 1/2 fms.	55°26′	8°02′	» »	0	♂	24·5	24	
		28	1738	1 mile SW of Cancer. 7 1/2 fms.	55°26′	8°02′	» »	0	♀	26	25·5	
		28	1740	3 miles S of Cancer. 7 1/2 fms.	55°26′	8°02′	» »	0	♂	25	25	
		28	1768	4 miles SW of Cancer. 9 fms.	55°26′	8°02′	» »	0	♀	23·5	22·5	
		28	1787	3 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	0	♀	25	24·5	
		28	1791	6 miles SW of Blaavand. 8 fms.	55°30′	7°57′	» »	0	♀	25·5	25·5	
		28	1811	3 miles WNW of Slugen N. 6 1/2 fms.	55°35′	7°43′	» »	0	♂	24	23·5	
		28	1823	2 miles S of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	30	29·5	
		28	1824	1 mile SE of Vyl buoy. 9 fms.	55°26′	7°52′	» »	0	♂	27·5	27	
		30	1748	2 miles NW of Slugen N. 8 fms.	55°36′	7°46′	» »	0	♀	25	24·5	
	May	1	1773	1 mile SW of Cancer. 7 fms.	55°26′	8°02′	» »	1	♀	27	25·5	
		3	1663	1 mile NW of Slugen N. 9 fms.	55°35′	7°46′	» »	1	♀	25	25	
		3	1821	1 mile NW of Slugen N. 9 fms.	55°35′	7°46′	» »	1	♀	25	25	
		5	1643	4 miles NW of Slugen N. 7 fms.	55°36′	7°44′	» »	1	♂	28	28	
		5	1664	10 miles NW of Blaavands Point. 8 fms.	55°39′	7°50′	» »	1	♂	23	23	
		6	1676	4 miles S of Vyl Light-ship 10 1/2 fms.	55°20′	7°47′	» »	1	♂	29·5	29·5	
		6	1784	1 mile SE of Cancer. 6 fms.	55°29′	8°03′	» »	1	♂	25	23·5	
		8	1788	1 mile W of Slugen N. 8 fms.	55°34′	7°46′	» »	1	♂	25	24·5	
		8	1830	1 mile S of Cancer. 8 fms.	55°26′	8°02′	» »	1	♂	26·5	26·5	
		9	1825	1 mile NE of Cancer. 5 fms.	55°30′	8°03′	» »	1	♀	24	24	
		11	1642	4 miles N of Blaavands Point. 4 fms.	55°36′	8°03′	» »	1	♀	23	22·5	
		11	1685	2 miles NE of Cancer. 6 fms.	55°30′	8°04′	» »	1	♀	25·5	28	
		11	1794	2 miles SW of Cancer. 8 fms.	55°26′	8°02′	» »	1	♀	24	23·5	
		12	1774	1 mile S of Cancer. 8 fms.	55°26′	8°02′	» »	1	♂	24	23	
		12	1834	12 miles NW of Cancer. 8 fms.	55°36′	7°44′	» »	1	♀	26	26·5	
		12	1839	4 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	1	♀	23·5	23	
		13	1826	2 miles NW of Graadeep. 7 1/2 fms.	55°26′	8°11′	» »	1	♂	25·5	25	
		14	1813	1 mile SW of Horns Reef. 18 fms.	55°33′	7°18′	» »	1	♀	25	25	
		15	1777	5 miles SE of Cancer. 7 1/2 fms.	55°26′	8°09′	» »	1	♀	26·5	27	
		16	1724	14 miles NE of Horns Reef. 10 fms.	55°47′	7°30′	» »	1	♀	26·5	26·5	
		16	1726	1/2 mile E of Vyl buoy. 5 fms.	55°27′	7°51′	» »	1	♂	27	29·5	
		16	1809	3 miles WSW of the Graadeep bell-buoy. 8 1/2 fms.	55°23′	8°14′	» »	1	♂	28	28	
		17	1722	5 miles SE of Cancer. 7 1/2 fms.	55°26′	8°09′	» »	1	♂	26	26	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date		No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. April 15. 8 miles SSW of Blaavands Point, North Sea. 55°26′ N 8°02′ E. 14 meters. "Thor" St. 381. 200 Plaice liber. (No. 1641—1840). "Thor"s marking experiment No. 8 1905.	1905 May	17	1810	10 miles NW of Slugen. 11 fms.	55°40′	7°32′	Danish S. B.	I	♂	29·5	29·5	
	» »	17	1831	6 miles NW of Cancer. 7 fms.	55°32′	7°53′	» »	I	♂	24·5	24	
	» »	18	1702	2 miles SE of Cancer. 7½ fms.	55°28′	8°04′	» »	I	♀	27·5	27	
	» »	19	1741	55°26½′ N 7°27½′ E. 9 fms.	55°26½′	7°27¼′	English S. S.	I	♀	24·5	25	sound
	» »	24	1675	2 miles WSW of Graadeep bell-buoy. 8 fms.	55°24′	8°14′	Danish S. B.	I	♀	28·5	29·5	
	» »	24	1715	8 miles NW of Slugen N. 8 fms.	55°38′	7°36′	» »	I	♂	24	24	
	» »	24	1746	55°40′ N 6°33′ E. 10 fms.	55°40′	6°33′	English S. T.	I	♂	24	24·5	sound
	» »	27	1840	3 miles NW of Ringebjerg. 6 fms.	55°38′	8°03′	Danish S. B.	I	♂	25·5	25·5	
	» »	29	1725	NW of Ringebjerg. 6 fms.	55°38′	8°03′	» »	I	♀	25·5	27	
	» »	29	1828	8 miles NW of Slugen N. 10 fms.	55°39′	7°32′	» »	I	♂	25	25	
	» »	30	1698	1 mile W of Kærgaarde. 4 fms.	55°42′	8°08′	» »	I	♂	23	24·5	
	» »	30	1707	1 mile W of Kærgaarde. 4½ fms.	55°41′	8°07′	» »	I	♀	29	29·5	
	» »	30	1789	54°56′ N 7°39′ E. 11 fms.	54°56′	7°39′	English S. T.	I	♂	24	25	sound
	» »	31	1655	55°15′ N 8°00′ E. 10 fms.	55°15′	8°00′	» »	I	♀	29	29	dried and salted
	» »	31	1770	4 miles ENE of Vyl Light-ship. 10 fms.	55°26′	7°51′	Danish S. B.	I	♂	23·5	23·5	
	» June	1	1836	4 miles E of Vyl Light-ship. 9 fms.	55°25′	7°51′	» »	II	♂	29·5	31·5	
	» »	3	1749	Vyl Light-ship.	55°24′	7°45′	English S. S.	II	♂	24	25	sound
	» »	4	1719	3 miles SE of Vyl Light-ship. 10½ fms.	55°22′	7°49′	Danish S. B.	II	♀	23·5	23·5	
	» »	4	1779	3 miles SE of Vyl Light-ship. 10 fms.	55°21′	7°50′	» »	II	♂	24	25	
	» »	4	1827	55°22′ N 7°47½′ E. 10 fms.	55°22′	7°47¼′	English S. T.	II	♀	28	26	dried and salted
	» »	5	1689	2 miles WSW of Vyl Light-ship. 10 fms.	55°22′	7°44′	Danish S. B.	II	♂	29	30	
	» »	5	1747	55°25′ N 7°50′ E. 9 fms.	55°25′	7°50′	English S. T.	II	♀	25·5	24·5	dried and salted
	» »	5	1778	2 miles WSW of Vyl Light-ship. 10 fms.			Danish S. B.	II	♀	27	28	
	» »	9	1723	4 miles N of Vyl Light-ship. 5 fms.	55°28′	7°46′	» »	II	♀	27·5	27·5	
	» »	10	1662	¼ mile SE of Slugen N. 11 fms.	55°34′	7°48′	» »	II	♀	27	27	
	» »	11	1756	10 mlles NW of Slugen N. 10 fms.	55°43′	7°40′	» »	II	♂	24	25·5	
	» »	15	1780	1 mile N by E of Slugen N. 7 fms.	55°34′	7°47′	» »	II	♀	25	26	
	» »	16	1797	7 miles W of Blaabjerg. 8 fms.	55°43′	8°03′	» »	II	♂	24	25	
	» »	16	1818	5 miles WNW of Aargab. 10 fms.	56°00′	8°03′	» »	II	♂	25	25	
	» »	18	1727	2 miles W of Kærgaarde. 6½ fms.	55°41′	8°06′	» »	II	♀	26	27·5	
	» »	26	1679	4 miles S of Vyl Light-ship. 8 fms.			» »	II	♀	25·5	27·5	
	» »	27	1795	55°32′ N 7°27½′ E. 12 fms.	55°32′	7°27½′	English S. S.	II	♂	26·5	28·5	sound
	» July	1	1767	8 miles NNE of Horns Reef Light-ship. 10½ fm.	55°41′	7°25′	Danish S. B.	III	♀	23·5		
	» »	6	1644	20 miles SW of Vyl Light-ship. 15 fms.	55°06′	7°26′	» »	III	♀	26	30	
	» »	6	1694	8 miles SW of Horns Reef Light-ship. 14 fms.	55°27′	7°12′	» »	III	♀	24	26·5	
	» »	6	1728	8 miles WSW of Horns Reef Light-ship. 15 fms.	55°29′	7°08′	» »	III	♀	25	28	
	» »	6	1731	55°00′ N 7°50′ E. 11 fms.	55°00′	7°50′	» »	III	♂	27		
	» »	10	1781	21 miles WNW of Blaavands Point. 15 fms.	55°48′	7°22′	» »	III	♂	26	30·5	
	» »	10	1798	8 miles NW of Blaabjerg. 11 fms.	55°50′	8°00′	» »	III	♂	23	27	
	» »	11	1711	10 miles W of Nymindegab. 12 fms.	55°47′	7°52′	» »	III	♀	23	28	
	» »	11	1753	14 miles N by W of Blaavand. 10 fms.	55°46′	7°56′	» »	III	♀	24·5	28·5	
	» »	12	1695	NNW of Helgoland. 85 miles distant.	55°25′	6°38′	German S. S.	III	♂	29	32	
	» »	17	1649	24 miles N of Slugen. 13 fms.	55°56′	7°38′	Danish S. B.	III	♀	25	30	
	» »	18	1673	SE of Vyl Light-ship.			» »	III	♂	27	27	dried and salted
	» »	27	1686	Helgoland. 13 fms.	54°15′	7°45′	Belgian S. S.	III	♀	28	32	
	» »	30	1800	20 miles NW of Slugen N. 12 fms.	55°46′	7°19′	Danish S. B.	III	♂	23	29·5	
	» August	4	1697	16 miles W by N of Haurvig Bn. 13 fms.	55°55′	7°41′	» »	IV	♂	25	30·5	
	» »	4	1775	16 miles W by N of Haurvig Bn. 13 fms.	55°55′	7°41′	» »	IV	♀	23	27	
	» Septbr.	13	1714	25 miles NNW of Slugen N. 12½ fms.	55°55′	7°23′	» »	V	♀	25·5	34	
	» »	13	1776	25 miles NNW of Slugen N. 12½ fms.	55°55′	7°23′	» »	V	♀	25·5	35·5	
	» »	14	1757	55°26′ N 5°45′ E. 48 meters.	55°26′	5°45′	German S. S.	V	♂	24	27·5	
	» »	18	1750	(North Sea.)			English S. S.	V	♂	24	27·5	fresh
	» »	20	1659	25 miles NNW of Slugen N. 13 fms.	55°56′	7°26′	Danish S. B.	V	♂	26	33·5	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery											
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E.	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
	1905 Octbr. 8	1763	55°44′ N 7°23′ E. 12 fms.	55°44′	7°23′	English S. S.	VI	♂	23	32	sound
	» » 14	1820	55°48′ N 7°25′ E. 12 fms.	55°48′	7°25′	» »	VI	♂	28	36·5	sound
	» » 20	1696	57°03′ N 6°25′ E. 26 fms.	57°03′	6°25′	» »	VI	♀	28	36	sound
	1906 April 8	1812	N of Bulbjerg. 12 fms.	57°17′	8°59′	Danish S. B	XII	♀	28	37·5	living
	» » 30	1764	54°44′ N 7°47′ E. 11 fms.	54°44′	7°47′	English S. S.	XII	♂	23	30	sound
	» May 9	1704	9 miles WSW of Graadeep. 9 fms.			Danish S. B.	XIII	♀	24·5	29·5	tail dry
	» Septbr. 4	1681	70 miles NW of Slugen. 23 fms.	56°11′	6°02′	» »	XVII	♀	26·5	39·5	sound
1905. April 15. Northern part of Slugen, North Sea. 55°36′ N 7°50′ E. 15 meters. "Thor" St. 382. 145 Plaice liber. (No.1841—1985). "Thor"s marking experiment No. 9 1905.	1906 April 19	1845	2 miles SW of Cancer. 7 fms.	55°26′	8°02′	Danish S. B.	0	♂	26	25·5	
	» » 19	1866	3 miles NW of Graadeep. 7½ fms.	55°27′	8°09′	» »	0	♀	28	28	
	» » 20	1854	1 mile S of Cancer. 8 fms.	55°26′	8°02′	» »	0	♂	25	24	
	» » 20	1858	6 miles W by N of Graadeep. 7 fms.	55°26′	8°05′	» »	0	♀	26·5	26·5	
	» » 20	1900	2 miles E of Vyl. 8 fms.	55°27′	7°54′	» »	0	♀	26·5	26	
	» » 20	1930	4 miles NW of Graadeep. 7 fms.	55°28′	8°08′	» »	0	♀	28	27·5	
	» » 20	1937	3 miles NW of Graadeep bell-buoy. 7½ fms.	55°27′	8°09′	» »	0	♀	28·5	28	
	» » 20	1940	3 miles NW of Graadeep bell-buoy. 7½ fms.	55°27′	8°09′	» »	0	♂	26	25·5	
	» » 21	1849	2 miles SSE of Cancer. 9 fms.	55°28′	8°04′	» »	0	♀	23	24	
	» » 22	1842	3 miles NW of Graadeep. 7 fms.	55°27′	8°08′	» »	0	♂	24·5	24	
	» » 22	1889	4 miles S of Vyl Light-ship. 11½ fms.	55°20′	7°47′	» »	0	♀	26·5	26·5	
	22	1893	1 mile S of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	26	25	
	» 22	1958	1 mile S of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	26	25·5	
	» » 26	1872	4 miles SW of Cancer. 7 fms,	55°26′	8°02′	» »	0	♂	26·5	26·5	
	» » 26	1887	4 miles SW of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	25	24·5	
	27	1861	1 mile NNE of Graadeep bell-buoy. 5½ fms.	55°27′	8°13′	» »	0	♀	25·5	25·5	
	27	1947	1 mile SE of Cancer. 8 fms.	55°29′	8°04′	» »	0	♀	24·5	24	
	» » 27	1949	1 mile SW of Cancer. 7½ fms.	55°26′	8°02′	» »	0	♂	26	[21·5]	
	» » 28	1846	1 mile S of Cancer. 7 fms.	55°26′	8°02′	» »	0	♀	23	22·5	
	May 1	1844	1 mile SW of Cancer. 7 fms.	55°26′	8°02′	» »	I	♀	24·5	24	
	» 1	1890	1 mile SW of Cancer. 7 fms.	55°26′	8°02′	» »	I	♂	26	25·5	
	» » 3	1879	2 miles NNW of Slugen N. 9 fms.	55°36′	7°46′	» »	I	♀	24·5	24	
	» » 4	1851	1 mile NW of Slugen N. 9 fms.	55°35′	7°47′	» »	I	♀	27	27	
	» » 7	1901	1 mile SSW of Cancer. 8 fms.	55°26′	8°02′	» »	I	♂	25	24·5	
	7	1953	1 mile SSW of Cancer. 8 fms.	55°26′	8°02′	» »	I	♀	24·5	23·5	
	» 7	1933	6 miles NW of Graadeep. 7 fms.	55°29′	8°06′	» »	I	♀	27·5	27	
	» 8	1857	3 miles SW of Blaavands Point. 6 fms.	55°31′	8°02′	» »	I	♂	24	23·5	
	» 9	1915	1 mile NE of Cancer. 5 fms.	55°30′	8°03′	» »	I	♂	24	24	
	» » 14	1905	6 miles W of Romø. 8½ fms.	55°07′	8°10′	» »	I	♀	26·5	26·5	
	» » 14	1964	2 miles NW of Graadeep. 8 fms.	55°26′	8°09′	» »	I	♀	26·5	26·5	
	15	1910	55°40′ N 8°00′ E. 9 fms.	55°40′	8°00′	English S. T.	I	♂	27·5		
	» » 17	1862	10 miles SW of Cancer. 15 fms.			Danish S. B.	I	♀	25·5	26	
	» » 17	1934	2 miles WNW of Slugen N. 8 fms.	55°35′	7°45′	» »	I	♀	27		
	» » 17	1946	1 mile SW of Horns Reef Light-ship. 18 fms.	55°33′	7°18′	» »	I	♀	26	26	
	17	1973	1 mile SW of Horns Reef Light-ship. 18 fms.	55°33′	7°18′	» »	I	♂	28	28	
	» 18	1843	1 mile N of Slugen N. 10 fms.	55°35′	7°47′	» »	I	♀	24	23·5	
	» 18	1969	8 miles NW of Slugen N. 8 fms.	55°38′	7°35′	» »	I	♀	24	23·5	
	» » 20	1972	2 miles N of Slugen N. 8 fms.	55°36′	7°46′	» »	I	♀	28	29	
	» » 26	1977	2 miles WNW of Slugen N. 8 fms.	55°35′	7°44′	» »	I	♀	28	29·5	
	» » 29	1886	8 miles NW of Slugen N. 10 fms.	55°39′	7°33′	» »	I	♀	24·5	24	
	June 4	1882	(North Sea.)			English S. S.	II	♀	24	25	sound, head removed
	» 4	1959	3 miles SE of Vyl Light-ship. 10 fms.	55°22′	7°50′	Danish S. B.	II	♂	25·5	25	
	5	1859	55°40′ N 7°30′ E. 8 fms.	55°40′	7°30′	» »	II	♀	23·5	23	dried and salted
	» » 5	1863	12 miles N of Horns Reef. 11 fms.			» »	II	♂	26	26	
	» » 5	1898	1 mile SE of Vyl Light-ship. 11 fms.	55°23′	7°47′	» »	II	♂	24·5	25	
	» 5	1926	4 miles S of Vyl Light-ship. 10 fms.	55°20′	7°48′	» »	II	♀	25	26·5	

Table 20. Continued.

Particulars of Liberation. Date. Locality. No. of Fish. etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. April 15. Northern part of Slugen, North Sea. 55°36′ N 7°50′ E. 15 meters. "Thor" St. 382. 145 Plaice liber. (No.1841—1985). "Thor"s marking experiment No. 9 1905.	1905 June 6	1871	(North Sea.)			English S. S.	II	♀	26·5	26	sound
	» » 7	1868	10 miles NW of Slugen. 10 fms.	55°35′	7°47′	Danish S. B.	II	♂	27·5	29	
	» » 11	1913	Off Kærgaarde. 7 fms.	55°42′	8°02′	» »	II	♂	25	26·5	
	» » 14	1841	Off Kærgaarde Bn. 7 fms.	55°42′	8°02′	» »	II	♂	27·5	28	
	» » 14	1850	55°42′ N 8°04′ E. 7 fms.	55°42′	8°04′	English S. T.	II	♂	23	23	sound
	» » 14	1916	Horns Reef.			» S. S.	II	♀	24	[31·5]	sound
	» » 15	1894	16 miles W of Blaabjerg. 8 fms.	55°41′	7°47′	Danish S. B.	II	♂	24·5		
	» » 16	1865	8 miles SE of Vyl Light-ship. 8 fms.	55°20′	7°56′	» »	II	♂	29·5	30·5	
	» » 16	1924	7 miles W of Kærgaarde. 7 fms.	55°41′	7°57′	» »	II	♀	25·5		
	» » 17	1878	55°20′ N 7°50′ E. 12 fms.	55°20′	7°50′	English S. T.	II	♂	30	31·5	sound
	» » 17	1897	3 miles NW of Kærgaarde. 8 fms.	55°42′	8°05′	Danish S. B.	II	♂	24·5	26·5	
	» » 18	1942	4 miles N of Vyl Light-ship. 8 fms.	55°28′	7°45′	» »	II	♀	24·5	27	
	» » 21	1883	55°09′ N 7°53′ E. 10 fms.	55°09′	7°53′	English S. S.	II	♂	27	25·5	dried and salted
	» » 27	1919	10 miles NNW of Vyl Light-ship. 10 fms.	55°31′	7°35′	Danish S. B.	II	♀	23·5	24	
	» » 27	1929	10 miles NNW of Vyl Light-ship. 10 fms.	55°31′	7°35′	» »	II	♀	26	27·5	
	» » 27	1943	10 miles W of Nymindegab. 10 fms.	55°45′	7°53′	» »	II	♂	27·5	29	a little dry
	» » 27	1974	12 miles off Blaabjerg. 9 fms.	55°44′	7°53′	» »	II	♂	29	31	
	» » 30	1936	4 miles NW of Slugen N. 10 fms.	55°37′	7°47′	» »	II	♀	25·5	29·5	
	» July 1	1891	6 miles WSW of Vyl Light-ship. 11 fms.	55°18′	7°43′	» »	III	♂	28	[26]	
	» » 1	1896	8 miles NW of Slugen N. 10 fms.	55°39′	7°33′	» »	III	♀	28		
	» » 2	1920	14 miles NE of Horns Reef Light-ship. 11 fms.	55°45′	7°30′	» »	III	♂	23	27	
	» » 2	1968	14 miles NE of Horns Reef Light-ship. 11 fms.	55°45′	7°30′	» »	III	♀	25·5	28	
	» » 10	1950	55°47′ N 7°15′ E. 10—11 fms.	55°47′	7°15′	English S. S.	III	♂	27	29	sound
	» » 10	1971	15 miles NW by W of Blaabjerg. 9 fms.			Danish S. B.	III	♀	23·5	26	
	» » 11	1860	10 miles W by S of Haurvig Bn. 12 fms.	55°51′	7°53′	» »	III	♂	24·5	27	
	» » 14	1856	55°35′ N 7°22′ E. 17 fms.	55°35′	7°22′	English S. S.	III	♂	25·5	30·5	
	» » 26	1957	8 miles NNE of Horns Reef. 10½ fms.	55°42′	7°22′	Danish S. B.	III	♂	24	30	
	» » 30	1867	1½ mile SW of Horns Reef Light-ship.	55°33′	7°18′	» »	III	♂	23	24·5	
	» August 4	1962	20 miles NNW of Slugen N. 14 fms.	55°49′	7°25′	» »	IV	♂	25·5		
	» » 10	1903	15 miles SW by S of Horns Reef Light-ship. 16fm.	55°21′	7°08′	» »	IV	♀	27	31	
	» » 18	1895	22 miles NNW of Slugen N. 15 fms.	55°54′	7°20′	» »	IV	♀	28	35	
	» Septbr. 9	1922	57°05′ N 6°45′ E. 33 fms.	57°05′	6°45′	English S. S.	V	♂	28·5	34	sound
	» » 19	1848	24 miles NNW of Slugen N. 12 fms.	55°54′	7°23′	Danish S. B.	V	♂	23·5	29·5	
	» » 26	1855	(North Sea.)			English S. S.	V	♀	29·5	39	sound
	» October 8	1875	(North Sea.)			» »	VI	♀	27	34·5	sound
	» » 16	1911	(North Sea.)			Danish S. B.	VI	♂	29		sound
	» » 18	1976	55°50′ N 7°42½′ E. 15 fms.	55°50′	7°42¼′	English S. S.	VI	♀	27	36·5	sound
	» » 19	1921	55°58′ N 7°05′ E.	55°58′	7°05′	German »	VI	♂	28	30	
	» » 21	1899	55°47′ N 7°25′ E. 12 fms.	55°47′	7°25′	English »	VI	♀	23·5	31·5	dried and salted
	» » 30	1892	55°52′ N 5°22′ E. 27 fms.	55°52′	5°22′	» »	VI	♀	25	31	sound
	» Novbr. 21	1931	NNW of Horns Reef Light-ship. 7 miles dist.	55°40′	7°13′	German S. T.	VII	♀	27·5	33	
	1906 Jan. 8	1870	(North Sea.)			English S. S.	IX	♂	28	34	sound immature
	» » 16	1917	56°20′ N 6°00′ E. 26 fms.	56°20′	6°00′	German S. T.	IX	♀	24	32	
	» June 1	1881	55°02′ N 8°10′ E. 7 fms.	55°02′	8°10′	English »	XIV	♂	24	29·5	dried and salted
1905. April 15. Graadyb, inside the bar. 55°26½′ N 8°16′ E. 6 meters. 40 Plaice liber. (No.1986—2025).	1905 April 22	2025	¾ mile N by E of Graadeep. 6 fms.	55°27′	8°13′	Danish S. B.	0	♀	25	24·5	
	» » 28	2022	1 mile S of Cancer. 7 fms.	55°26′	8°02′	» »	0	♂	24	23·5	
	» May 4	2007	1 mile S of Cancer. 9 fms.	55°26′	8°02′	» »	I	♀	24·5	23·5	
	» » 5	2004	4 miles NW of Slugen N. 7 fms.	55°36′	7°42′	» »	I	♀	23·5	23·5	
	» » 5	2019	1 mile W of Slugen N. 8 fms.	55°34′	7°46′	» »	I	♂	25	24·5	
	» » 7	2000	½ mile S of Cancer. 8 fms.	55°26′	8°02′	» »	I	♀	23	24·5	
	» » 15	2001	5 miles SE of Cancer. 7½ fms.	55°26′	8°09′	» »	I	♀	25	25	

Table 20. Continued

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery											
	Date	No. on Label	Locality reported	Central Position (Approximately) N	Central Position (Approximately) E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
"Thor"s marking experiment No. 10 1905.	1905 May 24	1986	NW by N of Elben's L. S. 6 miles distant.	54°04′	8°05′	German S. T.	I	♂	25·5	23·5	
	» » 24	1988	7 miles W of Kærgaarde. 8½ fms.	55°40′	7°57′	Danish S. B.	I	♂	25	25·5	
	» » 24	2003	2 miles W of Graadeep bell-buoy. 8 fms.	55°26′	8°10′	» »	I	♂	25	25·5	
	24	2008	1 mile SW of Graadeep bell buoy. 6½ fms.	55°25′	8°13′	» »	I	♀	25	24	
	June 1	2015	55°10′ N 7°40′ E. 10 fms.	55°10′	7°40′	English S. T.	II	♂	24	23	dried and salted
	3	1992	12 miles W of Graadeep. 8 fms.	55°23′	7°55′	Danish S. B.	II	♂	24	24	
	5	1994	8 miles NW of Slugen N. 7 fms.	55°39′	7°37′	» »	II	♂	25	27	
	7	1997	6 miles E of Vyl Light-ship. 9 fms.	55°25′	7°55′	» »	II	♂	24	24·5	
	11	2016	¼ mile NW of Slugen N, 11 fms.	55°34′	7°47′	» »	II	♂	25	25·5	
	14	1998	55°41′ N 7°22′ E. 10 fms.	55°41′	7°22′	English S. T.	II	♀	25	27·5	sound
	» » 17	1987	3 miles W of Kærgaarde. 7 fms.	55°41′	8°05′	Danish S. B.	II	♂	25	26·5	
	» » 17	2009	3 miles NW of Kærgaarde. 8 fms.	55°43′	8°05′	» »	II	♂	23·5	24·5	
	21	2002	About 54° N 8° E. 10 fms.	54°00′	8°00′	Belgian S. T.	II	♀	23	24	
	26	1989	4 miles N of Vyl Light-ship. 8 fms.	55°28′	7°45′	Danish S. B.	II	♀	24	25·5	
	26	1990	(North Sea.)			English S. S.	II	♀	25	27	
	29	2020	N of Horns Reef. 7fms.			Danish S. B.	II	♀	25	25·5	
	July 7	2023	56°47′ N 7°34′ E. 15 fms.	56°47′	7°34′	English S. S.	III	♂	23	24·5	sound
	» 29	1991	55°42½′ N 7°10′ E.	55°42½′	7°10′	» »	III	♂	23	27	
	Septbr. 20	2011	25 miles NNW of Slugen N. 13 fms.	55°54′	7°23′	Danish S. B.	V	♀	25	34	
	21	2021	55°19′ N 7°46′ E. 14 fms.	55°19′	7°46′	English S. S.	V	♂	23	31	sound
	25	1996	3 miles W of Blaabjerg. 8½ fms.	55°43′	8°06′	Danish S. B.	V	♂	23	29·5	
	1906 May 24	2017	53°45′ N 5°10′ E. 10 fms.	53°45′	5°10′	Dutch S. S.	XIII	♂	23	31·5	sound

F. The ordinary marking experiments with plaice in the Graadeep inshore-waters in the autumn of 1905.

In the Graadeep inshore-waters between Esbjerg and Skallingen 21 marked plaice of 20—26 cm. length were liberated on September 29th and 30th of 1905. Within one year 7 specimens or 33·3 % were recaptured.

A detailed record over particulars of liberation and recaptures is represented on Table 22. It will be seen that only three of the liberated specimens were recaptured during the inshore fishing in the autumn. Next spring and summer 4 specimens were recaptured in the North Sea and one of those by a foreign trawler.

The length of the liberated specimens was as follows:

	males	females		males	females
20 cm.	5	2	24 cm.	..	3
21 »	..	3	25 »	1	..
22 »	1	2	26 »	1	1
23 »	..	2			

Table 21. Table showing the size of plaice at liberation and the specimens of the various size-groups that have been recovered until September 30., 1906. The Danish marking experiments in the spring of 1905.

	N. of Anholt				SW. of Anholt				Off Spirbakken				Off Bulbjerg				Off Torup				Aalbæk Bay				SSE. of Hals				SSW. of Blaavands Point				Slugen				Graadeep			
	Marking exper. No. 1				Marking exper. No. 2				Marking exper. No. 3				Marking exper. No. 4				Marking exper. No. 5				Marking exper. No. 6				Marking exper. No. 7				Marking exper. No. 8				Marking exper. No. 9				Marking exper. No. 10			
	♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀		♂		♀	
	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.	Lib.	Rec.
19 cm.	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20 »	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21 »	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..
22 »	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	21	12	16	9	5	1	8	3	..	..	..	..	2	..	1	..	..	..	..	..	..	..
23 »	..	..	..	..	..	..	..	..	11	2	13	2	2	1	1	..	2	1	4	1	18	10	16	8	6	3	13	8	18	10	16	9	6	4	8	6	7	6	6	3
24 »	..	..	..	..	4	3	..	..	9	2	15	1	6	2	5	2	1	1	3	..	25	12	25	11	7	2	6	3	21	15	14	10	16	9	16	11	5	4	2	2
25 »	..	..	..	..	11	7	4	3	12	2	18	2	29	12	24	10	3	2	3	1	18	10	28	13	7	3	7	4	20	15	23	20	13	6	13	8	11	7	9	7
26 »	5	2	2	1	17	12	14	9	12	2	8	1	45	16	38	18	2	1	2	..	16	11	22	12	6	4	9	6	17	14	13	9	11	7	13	9	..	..	..	..
27 »	1	..	..	..	22	11	9	9	10	4	21	6	56	28	57	27	..	..	1	1	8	5	14	10	2	1	7	6	15	11	13	12	10	6	12	7	..	..	..	..
28 »	3	3	3	3	26	19	20	10	10	2	17	7	73	34	51	25	2	..	5	1	12	5	12	10	3	1	2	..	8	5	6	5	7	5	10	7	..	..	..	..
29 »	2	2	1	1	33	28	28	16	6	2	17	9	53	28	60	32	2	2	..	..	12	8	13	10	..	..	3	1	9	8	5	2	3	3	2	1	..	..	..	..
30 »	2	2	3	2	29	26	22	17	1	1	13	9	18	11	37	23	..	..	4	1	5	3	9	5	..	..	3	1	..	..	1	1	1	1	..	..	..	..	..	..
31 »	2	2	4	3	13	10	14	11	2	1	2	1	8	4	9	4	2	..	1	1	..	..	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
32 »	6	4	6	5	8	5	11	8	1	..	..	..	..	..	..	..	1	..	2	1	4	2	1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..
33 »	9	7	7	6	3	3	3	3	..	..	..	..	1	1	..	..	..	..	..	..	1	1	1	1	1	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..
34 »	3	2	9	7	..	..	6	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35 »	4	1	6	4	1	1	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
36 »	6	6	6	5	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37 »	1	1	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38 »	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
39 »	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
⋮																																								
43 »	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
⋮																																								
48 »	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	44	32	51	38	168	125	137	94	75	18	125	38	293	137	282	141	15	7	25	7	140	79	160	92	38	15	62	35	108	78	92	68	70	41	75	49	23	17	17	12

Table 22. Table showing particulars of Liberation and Recapture of plaice in the ordinary marking-experiment in September, 1905.

Particulars of Liberation. Date. Locality. No. of Fish etc.	Particulars of Recovery										
	Date	No. on Label	Locality reported	Central Position (Approximately) N	E	Fishing Vessel	No. of months between Liberation and Recovery	Sex	Initial Size	Ultimate Size	Remarks
1905. Sept. 29. Graadeep, W. of Esbjerg Harbour 55°28′N 8°25′E. 9 meters. 21 plaice liberated (No. 2026-2046). "Thor"s marking experiment No. 11 1905	1905 Novbr. 1	2028	At Sandodden.	55°28′	8°25′	Danish S.B.	II	♀	21	20·5	
	» » 14	2040	Off Jerg. Northend of Fanø.	55°29′	8°23′	» »	II	♀	23	22·5	
	» » 14	2046	Off Jerg, Northend of Fanø.	55°29′	8°23	» »	II	♂	20	20	
	1906 March 16	2034	53°45′N 6°30′E. 15 fms.	53°45′	6°30′	Dutch S. T.	VI	♂	25	25·5	
	» April 6	2030	8 miles NW of Red Cliff. 7 fms.	55°02′	8°07′	Danish S.B.	VII	♀	24	24	
	» » 27	2037	29 miles SW of Graadeep. 9 fms.	55°02′	7°53′	» »	VII	♂	20	21	
	» July 5	2035	20 miles SW of Graadeep. 10 fms.	55°09′	7°56′	» »	X	♂	20		rotten

G. The ordinary marking experiments in the Horns Reef area in April of 1906. Preliminary record.

On April 7th and 10th of 1906, 200 marked plaice of a length of 24—31 cm. were liberated in the Horns Reef area near Slugen. Until the end of September, 1906, 126 specimens or 63% were recovered.

As is usually the case in the Horns Reef area a far greater percentage was recaptured of the larger than of the smaller specimens. At liberation 180 specimens measured 25 cm. or above, while the length of 20 specimens only was 24 cm. Until September 30th, 1906, 121 specimens or 67·2% were recovered of the former, and 5 specimens or 25% of the latter.

III. Discussion of the Results of the Danish marking experiments with plaice in the years 1903—1906.

A. Rate of growth of plaice.

The growth of plaice varies according to the stage of development as well as to the density of "population" and to the locality where they live. In the larger specimens a considerable difference in the rate of growth may be noticed in the two sexes, the females increasing with far greater rapidity than the males. It is hardly the most common case that the plaice increase in growth with the greatest rapidity during their first year. Very frequently a more rapid growth may be traced in the second or third year of their life. On approaching maturity there is a considerable decrease in growth, and the mature specimens grow on the whole with far less rapidity than the immature ones.

1. Rate of growth of plaice of different sex.

As will be seen in the Tables 23 and 24 the specimens of the two sexes of the plaice of the "northern form"[1] increase in growth with about equal rapidity as long as they are below 30 cm. At a size of 30—34 cm. the growth is already considerably quicker in the females than in the males. Through investigations of the otoliths it may be proved that the growth in smaller specimens also is a little more rapid in the females than in the males.

Table 23. Rate of Growth of plaice of different sex. Marking and Transplantation experiments in the Horns Reef area. February, 1904. (Mark. exper. No. 1, 2 and Trpl. exper. No. 1—9).

Month recovered	Period between Liberation and Recovery	Males between 20—24 cm.		Females betw. 20—24 cm.	
		Average increase	No.	Average increase	No.
1904 June	4 months	1·5	4	1·3	6
» July	5 »	5·2	3	3·8	4
» August	6 »	5·0	4	5·0	1
» September ..	7 »	...	..	6·5	1
» October	8 »	5·5	1	7·3	2
» November ..	9 »	5·3	3	...	..
» December...	10 »	6·0	1	...	..
1905 February ...	12 »	...	..	5·5	1
» March.....	13 »	5·8	2	...	..
» April..... ..	14 »	5·0	1	6·0	1
» May	15 »	...	..	7·4	5
» June	16 »	10·0	3	5·5	1
» July	17 »	7·5	1	9·0	1
» August	18 »	13·0	1	8·5	1
» November ..	21 »	...	..	8·5	1

Table 24. Rate of Growth of plaice of different sex. Marking experiments in the middle Kattegat. March, 1905. (Exper. No. 1, 2 and 7.)

Month recovered	Period between Liberation and Recovery	Males				Females			
		Average increase of specimens between 22-29 cm	No. of specimens of initial length 22-29 cm.	Average increase of specimens between 30-34 cm.	No. of specimens of initial length 30—34 cm.	Average increase of specimens between 22-29 cm.	No. of specimens of initial length 22-29 cm.	Average increase of specimens between 30-34 cm.	No. of specimens of initial length 30—34 cm.
1905 April ..	1 month	0·2	6	0·4	8	1·0	4	0·4	10
» May...	2 months	0·8	20	1·0	8	1·1	12	1·1	12
» June ..	3 »	2·0	9	4·0	2	2·0	6	1·6	8
» July ..	4 »	2.4	9	3·0	6	3·4	11	3·3	7
» August.	5 »	2·0	5	1·5	2	3·4	9	2·3	3
» Sept. ..	6 »	3·6	4	2·3	3	3·9	5	3·0	1
» Octbr. .	7 »	3·6	6	...	..	6·0	1	3·5	2
» Novbr.	8 »	3·0	2	4·3	3	5·0	1	2·5	1
» Decbr..	9 »	9·0	1	...	..	...	..	5·3	2
1906 Jan....	10 »	5·0	1	...	..	6·2	3	8·0	1
» Febr...	11 »	6·0	1	4·0	1	7·8	2	8·0	1
» March .	12 »	...	..	3·0	1	4·0	1	2·3	2
» April ..	13 »	...	..	2·0	1	9·0	2	6·8	2
» May...	14 »	10·0	1	...	..	...	..	...	..
» June ..	15 »	6·0	1	...	..	7·5	2	...	..
» July ..	16 »	7·0	1	...	..	...	..	...	..
» August.	17 »	5·0	1	...	..	...	..	...	..

[1] I use the term "northern form" for the plaice which have their home in the northern part of the North Sea, the Skagerak, and a part of the northern Kattegat, in opposition to the "southern form" or the "dwarf-form" whose home is the southern Kattegat, the Belt Sea and the Baltic. This dwarf-form has been mentioned in various papers by Holt, Duncker, Mortensen, Petersen, Kyle a. o.

2. Rate of growth of plaice in the Horns Reef area.

The Danish marking experiments have revealed a fact of great importance, namely that plaice of the same size may in different years grow with very unequal rapidity on the same fishing grounds.

As will be seen in the Tables 26, 27, 28 the marking experiments show that the rate of growth of plaice in the Horns Reef area has been greater in 1904 than in 1903, and still greater in 1905 than in 1904. The difference is so conspicuous that it may not be mistaken. The monthly averages are sufficiently consistent with one another to make us believe that we have for all the three years determined the rate of growth on a fairly solid basis.

The experiments in spring of 1903 showed a rate of growth of 4—4·5 cm. in one year. In the experiments in spring of 1904 the increase in growth was in one year ca. 6 cm., and finally in the experiments in 1905 the growth was in one year 7·5—8 cm.

As it has become evident that the young plaice grow relatively slowly in places where they are exceedingly numerous, and relatively quickly where they are more scarce, it might seem an obvious conclusion that the unequal rate of growth might be due to an unequal density of population, the density decreasing in the years from 1903 to 1905. If this be the reason of the unequal rapidity in growth, it must be supposed that the diminishing density is a phenomenon which has only been of consequence for the young, not yet marketable, plaice. It appears namely that in 1903, when the plaice in the Horns Reef area increased slowly, the Esbjerg cutters' yield of the plaice-fishery — which essentially is carried on in this area — was comparatively slight, while the yield was considerably greater in 1904 and 1905 when the rapid growth took place (see Table 25).

At the same time as we trace a relatively rapid growh of plaice, namely in the month of July, 1904, the Esbjerg cutters begin to get a relatively rich yield.

Thus we must suppose that a proportionately larger number of marketable plaice (above 25 cm.) has been present in the Horns Reef area in 1904 and 1905 than in 1903. That the yield of the fishery becomes considerable in the years where a rapid growth takes place may naturally be understood from the consideration that proportionately many undersized fish grow up to a marketable size.

It is also worthy of note that in 1902, when the yield of the plaice-fishery at Horns Reef was uncommonly rich (see Table 25), the rapidity of growth for the plaice has probably also been very considerable. We have, namely, ascertained by investigating otoliths of plaice recovered in the Horns Reef area in April, 1903, that a great part of the specimens at a size of 25—28 cm. (see Contributions I p. 8, Stat. 38—39—41) were only 3 years old. It is probable that such specimens in the course of their third year, i. e. in 1902, have increased about 10 cm. in growth. It may however be admitted that we do not know if these specimens have lived in 1902 on the Horns Reef grounds or if they have come from other areas.

These investigations have thus afforded some reason to suppose that there is a connection between the rapidity of growth of the plaice in the Horns Reef area and the yield of the plaice-fishery in this area. Future investigations may elucidate this matter further. The possibility is not yet excluded that the small yield of the plaice-fishery in the Horns Reef area in 1903 and the proportionately great yield in 1902, 1904 and 1905 may be due to other causes than those here mentioned (see the section B).

In the Table below, which has been compiled from the Danish "Fiskeri-Beretning", a summary is given over the monthly yield of the Esbjerg cutters plaice-fishery in the years 1897—1905[1]. As fishing unit we have chosen a "cutter day", a term which should be understood in the following way. The number of cutters fishing in a month has been multiplied by the number of "fishing days", which

[1] The statistics for the Esbjerg fishery are very important as the original data have been collected with great care (by Mr. Lorck Madsen).

means the days when the weather has allowed fishing by snurrevaad. The product is the number of cutter days. If for instance it is stated, that 75 cutters have been fishing in a month and that there have been 10 "fishing days" the number of "cutter-days" will for that month amount to 750: a somewhat higher figure than we would get if we knew the exact number of fishing days for each cutter separately.

It may be seen in Table 25 that the yield has been far less in 1903 than in 1902, 1904 and 1905, both when we regard the total yield and when we consider the yield per cutter-day. It is moreover interesting to notice, that while the total yield has on the whole increased in the course of the years 1897—1905, the yield per "cutter-day" has on the whole decreased, and this in spite of the fact that the cutters' fishing power has been greatly improved.

Table 25. The catch of plaice by the Esbjerg cutters in the years 1897—1905.

Period	Total quantity in kilograms	Number of "cutter-days"	Average catch per "cutter-day" in kilograms
1897 January	0	0	...
» February	0	0	...
» March	5,500	62	89
» April	332,000	558	595
» May	261,000	450	580
» June	137,000	360	381
» July	98,000	270	363
» August	66,000	210	314
» September	28,000	56	500
» October	302,000	224	1,348
» November	75,000	125	600
» December	0	0	...
1897 Total	**1,305,000**	**2,315**	**564**
1898 January	0	0	...
» February	0	0	...
» March	15,000	62	242
» April	144,000	369	390
» May	259,000	615	421
» June	87,000	228	382
» July	3,000	66	45
» August	57,000	204	279
» September	99,000	204	485
» October	156,000	216	722
» November	148,000	210	705
» December	0	0	...
1898 Total	**968,000**	**2,174**	**445**
1899 January	0	0	...
» February	0	0	...
» March	119,000	164	726
» April	352,000	430	819
» May	322,000	516	624
» June	334,000	390	856
» July	190,000	480	396
» August	91,000	204	446
» September	0	0	...
» October	71,000	264	269
» November	0	0	...
» December	0	0	...
1899 Total	**1,479,000**	**2,448**	**604**

Period	Total quantity in kilograms	Number of "cutter-days"	Average catch per "cutter-day" in kilograms
1900 January	0	0	...
» February	0	0	...
» March	55,000	164	335
» April	246,000	400	615
» May	354,000	686	516
» June	235,000	470	500
» July	139,000	516	269
» August	86,000	240	358
» September	80,000	312	256
» October	0	0	...
» November	58,000	132	439
» December	32,000	129	248
1900 Total	**1,285,000**	**3,049**	**421**
1901 January	0	0	...
» February	0	0	...
» March	14,000	164	85
» April	199,000	520	383
» May	406,000	954	426
» June	341,000	936	364
» July	255,000	750	340
» August	77,000	351	219
» September	88,000	129	681
» October	182,000	540	337
» November	202,000	492	411
» December	1,000	3	333
1901 Total	**1,765,000**	**4,839**	**365**
1902 January	0	0	...
» February	500	6	83
» March	87,000	387	225
» April	434,000	918	473
» May	741,000	1,272	583
» June	461,000	990	466
» July	157,000	612	257
» August	373,000	750	497
» September	179,000	588	305
» October	165,000	450	367
» November	38,000	432	88
» December	300	c. 2	c. 150
1902 Total	**2,636,000**	**6,407**	**411**

Table 25. Continued.

Period	Total quantity in kilograms	Number of "cutter-days"	Average catch per "cutter-day" in kilograms
1903 January	0	0	...
» February	250	4	63
March	193,000	720	268
April	331,000	1,116	297
May	362,000	1,170	309
June	189,000	1,134	167
July	202,000	960	210
August	55,000	348	158
September	49,000	441	111
October	7,500	126	60
November	26,000	c. 240	108
December	0	0	
1903 Total	**1,415,000**	**6,259**	**226**
1904 January	0	0	...
» February	9,000	27	333
March	130,000	780	167
» April	280,000	594	471
May	306,000	1,152	266
June	277,000	768	361
July	314,000	1,152	273
August	353,000	930	380
September	390,000	1,116	349
October	284,000	945	301
» November	112,000	195	574
December	0	0	
1904 Total	**2,455,000**	**7,659**	**321**
1905 January	0	0	
» February	0	0	...
» March	180,000	603	299
» April	232,000	1,005	231
» May	554,000	1,260	440
» June	436,000	1,260	346
» July	394,000	1,050	375
» August	256,000	1,035	247
» September	400,000	1,224	327
October	177,000	1,005	176
» November	10,000	938	11
» December	0	0	
1905 Total	**2,639,000**	**9,380**	**281**

The fact that the plaice on the same fishing grounds may increase in length with very unequal rapidity in different years makes the question about profitable transplantation of plaice in the sea rather complicated.

As will be seen in the Table 29, the plaice of 25—29 cm. seem to increase in size with a similar rapidity to those of 20—24 cm. in the Horns Reef area.

Table 26. Rate of Growth of plaice liberated in the Horns Reef Area in April of 1903. (Mark. exper. No. 1—5.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1903. April 10.—11.	1903 May	1 month	0·3	0	3	101	26·8	18	39
	» June	2 months	0·8	0	2	23	25·7	22	32
	July	3 »	1·4	0	3·5	7	27·1	22	32
	» August	4 »	2·2	1	4	9	26·1	21	40
	» Septbr.	5 »	2·0	2	2	2	27	23	31
	October	6 »	2·3	2	2·5	2	28	28	28
	» Novbr.	7 »	3·3	1	5	4	21·5	16	25
	» Decbr.	8 »	2·8	2	3·5	2	23·5	21	26
	1904 January	9 »	5·5	...	...	1	23	..	..
	» March	11 »	3·9	2	4·5	4	22·3	18	25
	» April	12 »	4·3	2	6	8	22·3	16	28
	May	13 »	3·9	1·5	6·5	7	22	17	26
	» June	14 »	4·6	2·5	6·0	4	21·3	20	23
	1905 Febr.	22 »	13·5	...	...	1	24	..	..
	» May	25 »	10	8·5	11·5	2	25	24	26
	June	26 »	17·5	...	...	1	17		..
	July	27	10·5	...	...	1	17		

Table 27. Rate of Growth of plaice liberated in the Horns Reef Area in February of 1904. Mark. exper. No. 1—2 and Trpl. exper. No. 1—9.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. Febr. 22.—26.	1904 Mareh	1 month	0·2	0	1	22	24·4	21	28
	» April	2 months	0·5	0	2·5	45	25·1	21	31
	» May	3 »	0·8	0	2·0	30	24	20	29
	» June	4 »	1·2	0	2·5	14	22·9	20	26
	» July	5 »	4·5	2·5	6	9	23·3	20	27
	» August	6 »	4·6	3	6	8	24·1	21	28
	» Septbr.	7 »	6·2	3·5	8·5	3	26·7	22	30
	» October	8 »	5·8	3	9	4	21·8	19	24
	» Novbr.	9 »	5·6	4·5	6·5	4	22·8	20	26
	» Decbr.	10 »	6·0	..	..	1	20	..	..
	1905 Febr.	12 »	5·5	..	..	1	21	..	..
	» March	13 »	5·8	5	6·5	2	22	21	23
	» April	14 »	5·5	5	6	2	20	20	20
	» May	15 »	7·4	3	9·5	5	22·4	21	23
	» June	16 »	8·9	5·5	11	4	21·8	20	24
	» July	17 »	8·3	7	9·5	2	22	21	23
	» August	18 »	10·8	8·5	13	4	23·5	20	27
	» Novbr.	21 »	9·8	8·5	11	2	26	24	28

Table 28. Rate of Growth of plaice liberated in the Horns Reef Area in April, 1905. (Mark. exper. No. 8, 9, 10.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. April 22.	1905 May	1 month	0·6	0	3	66	25·3	23	29
	» June	2 months	1·5	0	4·5	50	25·4	23	30
	» July	3 »	4·0	1	7	22	24·7	23	29
	» August	4 »	5·6	4·5	7·5	4	25·8	23	28
	» September	5 »	7·5	3·5	10·5	11	25	23	29
	» October	6 »	7·9	2·5	10	8	26·1	23	29
	» November	7 »	6·0	...	...	1	27	..	..
	1906 January	9 »	7·5	6·5	8·5	2	26	24	28
	» April	12 »	8·5	7·5	9·5	2	25·5	23	28
	» May	13 »	7·3	5·5	9	2	23·5	23	24
	» June	14 »	6·5	...	...	1	24	..	..
	» September	17 »	13·5	...	...	1	26·5	..	..

Table 29. Rate of Growth of plaice of different sizes, liberated in the Horns Reef Area. February, 1904. (Mark. exper. No. 1—2 and Trpl. exper. No. 1—9.)

Month recovered	Period between Liberation and Recovery	Average increase of specimens betw. 20—24 cm.	No. of specimens of initial length 20—24 cm.	Average increase of specimens betw. 25—29 cm.	No. of specimens of initial length 25—29 cm.
1904 June	4 months	1·4	10	0 8	4
» July	5 »	4·4	7	4·8	2
» August ..	6 »	5·0	5	4·0	3
» Septbr. ..	7 »	6·5	1	8·5	1
» October .	8 »	6·7	3	...	.
» Novbr. ..	9 »	5·3	3	7·0	1
» Decbr....	10 »	6·0	1	...	..
1905 February	12 »	5·5	1	...	..
» March ...	13 »	5·8	2	...	..
» April	14 »	5·5	2	...	..
» May.....	15 »	7·4	5	...	..
» June	16 »	8·9	4	...	..
» July.....	17 »	8·3	2	...	..
» August ..	18 »	10·8	2	10·8	2
» Novbr. ..	21 »	8·5	1	11·0	1

3. The Rate of Growth of plaice in the Hanstholm—Søndervig area.

To judge from the relatively few specimens which are represented in Table 30 the increase in growth of the plaice of 22—35 cm. liberated in the Hanstholm—Søndervig area may be put down to ca. 8 cm. for the year 1903, or about twice as much as the increase of plaice in the Horns Reef area in that year.

From the marking experiments in 1905 there are so few recaptures that we cannot settle with any certainty how great the normal increase has been in the course of one year, but it is reasonable to suppose a somewhat similar increase to that in 1903 (see Table 31).

Table 30. Rate of Growth of plaice liberated in the Hanstholm—Søndervig Area. April, 1903. (Exper. No. 15—17.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length of specimens cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1903. April 23.	1903 May	1 month	0·6	0	2	7	29·0	22	34
	June	2 months	1·5	0·5	3	5	29·6	27	31
	July	3 »	2·4	1·5	3	4	29·5	24	33
	August	4 »	3·5	...	...	1	33	..	..
	» September	5 »	1·5	...	...	1	26	..	..
	1904 April	12 »	8·0	6·5	9·5	2	27·5	25	28
	» May	13 »	8·8	7·5	10	2	26·5	26	27
	» June	14 »	9·0	...	...	1	31	..	..
	» July	15 »	6·5	...	...	1	35	..	..

Table 31. Rate of Growth of plaice liberated in the Hanstholm—Søndervig Area. March, 1905. (Marking experiment No. 5.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. March 24.	1905 April	1 month	0·3	0	0·5	3	26	25	28
	» May	2 months	1·5	...	...	1	23	..	..
	» June	3 »	1·9	1·5	2	4	26·8	23	30
	» July	4 »	3·5	3	4·5	3	29	27	31
	August	5 »	3·5	...	...	1	32	..	..
	1906 January	10 »	7·0	...	...	1	24		

4. Rate of growth of plaice in the Skagerak.

The rate of growth of the plaice which were marked in the Skagerak in April, 1903, March, 1904, and March, 1905, is represented in the Tables 32, 33, 34.

From the experiments in 1903 we know only the yearly increase in growth of the small specimens of 16—24 cm. The growth appears in the course of one year to have been at least 10 cm. for these. A considerably less rapidity of growth may be noticed in the transplantation experiments in 1904 for specimens of 22—27 cm., and in the ordinary marking experiments in 1905 for specimens of 23—30 cm., namely ca. 7—8 cm. The difference in the initial size in the specimens from the experiments in 1903 and the two series of experiments in 1904 and 1905 is, however, so considerable that it may play an essential rôle in comparing the rate of growth.

It will be seen in the Tables 35 and 36 that though the specimens exceeding 30 cm. have had a less rapidity of growth than the smaller specimens their increase in length is still quite considerable.

In the experiments of 1903 the growth of specimens of 30—36 cm. appears to be at least 4 cm. for the period from April to September. In the experiments of 1905 four specimens of a length of 30—33 cm. increased during 7—11 months on an average 5·5 cm.

Table 32. Rate of Growth of plaice liberated in the Skagerak. April 1903. (Exper. No. 6—14.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1903. April 17—22.	1903 May	1 month	0·4	0	1·5	13	25·7	17	33
	» June	2 months	1·4	0	2·5	4	29	25	33
	» July	3 »	4·0	3·5	5·5	5	28	22	32
	» August	4 »	5·5	5·5	5·5	2	27·5	27	28
	» September	5 »	6·7	4	8·5	3	24·3	16	36
	» November	7 »	10·5	...	...	1	18	..	..
	1904 June	14 »	13·5	11·5	15·5	2	21	21	21
	» July	15 »	13·5	...	...	1	20	..	..

Table 33. Rate of Growth of plaice transplanted from Graadeep to Jammer Bay in the Skagerak on March 1st, 1904. (Transpl. exper. No. 10.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. March 1.	1904 April	1 month	0·4	0	0·5	7	25·0	24	26
	» May	2 months	0·7	0	2·0	9	25·3	23	28
	» June	3 »	2·0	0	3·5	10	25·3	23	27
	» July	4 »	5·3	4	6·5	4	24·3	21	27
	» August	5 »	5·0	..	..	1	26	..	..
	» September	6 »	4·5	4	5	2	24	22	26
	» November	8 »	6·0	..	..	1	23	..	..
	1905 March	12 »	7·8	6	9·5	2	24·5	22	27

Table 34. Rate of Growth of plaice liberated in the Skagerak. March, 1905. (Marking experiment No. 3 and 4.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905. March 22.-24.	1905 April	1 month	0·3	0	2	48	28	23	33
	» May	2 months	0·8	0	3	125	28	23	31
	» June	3 »	1·6	0	4	41	27·8	23	31
	» July	4 »	3·6	1	7	53	27·5	24	30
	» August	5 »	3·7	1	7	11	27·1	24	30
	» September	6 »	5·7	4	9	8	26·6	23	29
	» October	7 »	6·3	6	6·5	2	29·5	29	30
	» November	8 »	7·5	6·5	8·5	2	29	28	30
	» December	9 »	12·0	...	...	1	27	..	..
	1906 January	10 »	3·7	3	4·5	3	27·7	26	30
	» February	11 »	6	6	6	2	28·5	27	30
	» April	13 »	7·5	6·5	8	3	26·7	25	28

Table 35. Rate of Growth of plaice of different sizes liberated in the Skagerak. April, 1903. (Exper. No. 6—14.)

Month recovered	Period between Liberation and Recovery	Average increase of specimens of initial length 15—24 cm.	No. of specimens between 15—24 cm.	Average increase of specimens of initial length 25—29 cm.	No. of specimens between 25—29 cm.	Average increase of specimens of initial length 30—36 cm.	No. of specimens between 30—36 cm.
1903 May.....	1 month	0·5	6	1·0	3	0·0	4
» June	2 months	...	..	1·3	2	1·5	2
» July	3 »	4·8	2	...	..	3·5	3
» August	4 »	...	..	5·5	2	...	..
September ...	5 »	8·0	2	...	..	4·0	1
» November ...	7 »	10·5	1	...	..	...	
1904 June	14 »	13·5	2	...	..		
» July	17 »	15·5	1	...	..	...	

Table 36. Rate of Growth of plaice of different sizes liberated in the Skagerak. March, 1905. (Exper. No. 3 and 4.)

Month recovered	Period between Liberation and Recovery	Average increase of specimens of initial length 23—29 cm.	No. of specimens betw. 23—29 cm.	Average increase of specimens of initial length 30—33 cm.	No. of specimens betw. 30—33 cm.
1905 April	1 month	0·3	35	0·3	13
» May	2 months	0·7	101	1·0	24
» June	3 »	1·6	37	1·4	4
» July	4 »	3·6	49	3·5	4
» August ..	5 »	3·7	9	3·8	2
» September	6 »	5·7	8	...	..
» October..	7 »	6·5	1	6·0	1
» November	8 »	8·5	1	6·5	1
» December	9 »	12·0	1	...	..
1906 January .	10 »	3·8	2	3·5	1
» February	11 »	6·0	1	6·0	1
» April....	13 »	7·5	3	...	...

5. Rate of growth of plaice liberated in the Kattegat.

A view is given over the rate of growth of the marked plaice in the Tables 37—43. The yearly increase in growth has been as follows for plaice from the northern and middle Kattegat:

for specimens of length from 21—31 cm. liberated in March, 1904, ca. 7 cm. (Table 37).

for specimens of length from 20—39 cm. liberated in October, 1904, ca. 5 cm. (Table 38 A & B).

for specimens of length from 22—37 cm. liberated in March, 1905, ca. 6 cm. (Table 39).

As the specimens have been of very unequal size and as they were liberated in rather different localities, the Tables 37—39 do not show how far the growth of the plaice in the northern and middle Kattegat has been different in the two years 1904 and 1905.

If we regard Table 40, which comprises solely specimens of 22—29 cm., liberated in the Aalbæk Bay or in the vicinity in March, 1904 and March, 1905 we get the impression that the plaice have here grown with a somewhat greater rapidity in 1904 than in 1905.

Table 37. Rate of Growth of plaice liberated in the northern Kattegat in March of 1904.
(Mark. exper. No. 3, 4, 5. Transpl. exper. No. 11.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. March 5.—21.	1904 April	1 month	0·6	0	1·5	25	25·3	22	31
	» May	2 months	1·7	1	2·5	8	23·5	21	25
	» June	3 »	2·3	0·5	4	16	24·4	21	27
	» July	4 »	3·9	2	6·5	16	24·2	22	26
	» August	5 »	5·3	3·5	6·5	4	23·8	22	28
	» September	6 »	6·3	5·5	7	4	23	22	24
	» October	7 »	6·8	6·5	7	2	22·5	22	23
	» November	8 »	8·5	...	...	1	22	..	..
	1905 March	12 »	4·5	...	...	1	24	..	..
	» July	16 »	3·0	...	...	1	22	..	..
	1906 February	23 »	8·0	...	...	1	26	..	..

Table 38 A. Rate of Growth of plaice liberated in the northern Kattegat. October, 1904.
(Exper. No. 6, 7, 8, 9.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. Octbr. 25.-28.	1904 November	1 month	0·8	0	2·0	16	27·7	22	34
	» December	2 months	1·2	0	2·5	17	30·1	22	36
	1905 January	3 »	1·7	0·5	3·5	12	28·0	23	32
	» February	4 »	1·4	0	3·5	5	24·4	22	29
	» March	5 »	1·4	0·5	2·5	7	27·4	22	35
	» April	6 »	0·7	0	1·5	3	28·3	23	32
	» May	7 »	2·7	1	4	12	26·3	20	33
	» June	8 »	3·5	0·5	5·5	10	26·6	23	32
	» July	9 »	4·6	3	7	5	27·4	21	31
	» September	11 »	7·0	...	...	1	26·0	..	..
	» October	12 »	5·8	4·5	7	2	26·5	22	31

Table 38 B. Rate of Growth of plaice liberated in the middle Kattegat. October, 1904.
(Exper. No. 10, 11. 12 & 13.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. Octbr. 25.-28.	1904 November	1 month	0·3	0	1·0	3	35·7	31	39
	» December	2 months	1·5	..	...	1	27	..	..
	1905 January	3 »	0·0	..	...	1	37	..	..
	» February	4 »	0·0	..	...	1	31	..	..
	» March	5 »	1·5	0	3·5	4	35·8	34	39
	» May	7 »	1·8	1	3·0	3	31·7	30	34
	» July	9 »	4·3	4	4·5	2	32	32	32
	» August	10 »	1·0	..	...	1	29	..	..
	» October	12 »	5·0	..	...	1	36	..	..
	» November	13 »	2·3	..	..	1	32	..	..

Table 39. Rate of Growth of plaice liberated in the northern and middle Kattegat in March of 1905. (Mark. exper. No. 1, 2, 6 and 7.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1905.	1905 April	1 month	0·3	0	2·5	113	27·6	22	36
March 15.—April 1.	» May	2 months	0·9	0	3	105	27·7	22	37
	» June	3 »	1·7	0	5·5	45	27·2	22	36
	» July	4 »	2·7	0·5	5	46	28·7	22	36
	» August	5 »	2·4	0	6	23	27·3	22	36
	» September	6 »	3·4	1	7·5	13	27·9	24	31
	» October	7 »	4·1	0·5	6	10	26·5	22	30
	» November	8 »	3·8	2·5	6·5	7	30·3	27	33
	» December	9 »	5·3	1·5	9	4	31·3	28	35
	1906 January	10 »	5·3	2·5	8	8	27·9	23	36
	» February	11 »	6·7	4	8·5	5	28·2	23	33
	» March	12 »	2·4	0·5	4	5	31	23	35
	April	13 »	6·7	2	9·5	5	28·2	25	30
	» May	14 »	7·0	4·0	10	2	24·5	23	26
	» June	15 »	7·0	6	8	3	26·3	22	29

Table 40. Rate of Growth of plaice of initial length 22—29 cm., liberated in Aalbæk Bay or Hertha's Flak in March, 1904, and March, 1905.

Month recovered	Period between Liberation and Recovery	Experiment March 1904		Experiment March 1905	
		Average increase	No. of specimens	Average increase	No. of specimens
June	3 months	1·8	5	1·0	18
July	4 »	4·0	3	2·0	9
August	5 »	3·5	1	0·7	3
October	7 »	6·5	1	6·0	1
January	10 »	...	..	3·5	1
May	14 »	...	..	3·5	1

In the experiments in the northern and middle Kattegat it has become evident that the specimens increase in growth with rather considerable rapidity till they reach a size of ca. 35 cm. The specimens which surpass this size are either mature or approach maturity for the first time, and the growth becomes now considerably slower than in the younger and smaller specimens. In the experiments in the middle Kattegat in March, 1905, the following growth might be noticed in the specimens which were recovered 9—14 months after liberation (see Table 41).

7 specimens of 22—25 cm. increased on an average 5·9 cm.
5 » » 26—29 » » » » 8·9 »
11 » » 30—34 » » » » 4·9 »
3 » » 35—37 » » » » 1·5 »

The figures stated here might seem to show that the yearly increase is greater for the specimens between 26 and 29 cm. than for the specimens between 22 and 25 cm. We are, however, not entitled to fix the yearly increase solely according to the few specimens that are recovered about a year after liberation. If we regard the total monthly averages the impression is conveyed that the specimens of the latter group have increased as quickly as the specimens of the former group. (Table 41.)

The experiments in 1904 and 1905 suggest in reality that the yearly average increase for plaice of 20—29 cm. amounts to at least 7 cm. in the northern and middle Kattegat.

Table 41. Rate of Growth of plaice of different sizes liberated in the middle Kattegat. March, 1905. (Exper. No. 1, 2 and 7.)

Month recovered	Period betw. Liberation and Recovery	Average increase of specimens of initial length 22—25 cm.	No. of specimens between 22-25 cm.	Average increase of specimens of initial length 26—29 cm.	No. of specimens between 26-29 cm.	Average increase of specimens of initial length 30—34 cm.	No. of specimens between 30-34 cm.	Average increase of specimens of initial length 35—37 cm.	No. of specimens between 35-37 cm.
1905 April ...	1 month	...	..	0·6	10	0·3	18	0·2	3
» May	2 months	0·9	8	0·9	24	1·1	20	1·2	5
» June....	3 »	2·1	6	1·9	9	2·1	10	1·3	2
» July	4 »	3·9	4	2·7	16	3·2	13	1·6	4
» August..	5 »	2·3	6	3·4	8	2·0	5	3·0	1
» Septbr...	6 »	5·8	3	2·8	6	2·5	4	...	..
» October .	7 »	4·3	2	3·8	5	3·5	2	...	..
» Novbr. ..	8 »	...	..	3·7	3	3·9	4	...	..
» Decbr. ..	9 »	...	..	9·0	1	5·3	2	1·5	1
1906 January.	10 »	5·3	3	7·5	1	8·0	1	2·5	1
» February	11 »	6·5	2	8·5	1	6·0	2	...	..
» March ..	12 »	4·0	1	...	..	2·5	3	0·5	1
» April ...	13 »	8·5	1	9·5	1	5·2	3	...	.
» May	14 »	...	..	10·0	1	...	..	...	..
» June....	15 »	7·0	1	7·0	2	...	..	...	..
» July	16 »	7·0	1	...	..	...	..	...	..
» August..	17 »	...	..	5·0	1	...	..	...	..

Table 42. Rate of Growth of plaice liberated in the southern Kattegat. October, 1904. (Exper. No. 14 and 14 A.)

Date liberated	Month recovered	Period between Liberation and Recovery	Increase			No. of specimens measured	Initial Length cm.		
			Average	Minimum	Maximum		Average	Minimum	Maximum
1904. Octbr. 25.-29.	1904 November	1 month	0	...	...	1	32	..	..
	» December	2 months	0	0	0	2	34	33	35
	1905 January	3 »	1	...	...	1	31	..	..
	» February	4 »	0·8	0	1·5	9	31·2	27	36
	» March	5 »	0·8	0	2	16	32·0	28	35
	» April	6 »	0·6	0	1·5	7	30·6	29	32
	» May	7 »	1·0	0	3	16	30·9	28	35
	» June	8 »	2·7	2	4·5	4	29·5	26	31
	» July	9 »	2·5	0·5	4·5	4	30·5	28	33
	» September	11 »	4·5	3·5	5·5	3	30	30	30
	» October	12 »	3·0	1·5	4·5	2	30	30	30
	» November	13 »	2·0	...	...	1	33	..	..
	» December	14 »	5·5	...	...	1	28	..	..
	1906 January	15 »	4·5	2	7	2	32·5	30	35
	» February	16 »	4·0	2·5	5·5	2	29·5	29	30
	» March	17 »	4·5	1	8	2	29	26	32
	» April	18 »	7·5	...	...	1	30	..	..
	» May	19 »	3·8	3·5	4	2	34	33	35
	» June	20 »	6·0	...	...	1	32	..	..
	» September	23 »	9·5	...	...	1	27	..	..

For plaice of a length from 26—39 cm. from the southern Kattegat liberated in October, 1904, the increase in growth has in the course of one year only been ca. 4 cm. (Table 42) but it should be remembered here that the majority of these specimens were already mature at liberation, while the great majority of the specimens from the northern and middle Kattegat had not reached maturity at liberation.

In one of the experiments in the southern Kattegat (No. 14 A) only mature females were liberated of a length from 26—36 cm. It appears from Table 43 that the yearly increase for such specimens has not been more than ca. 2 cm.

As the female plaice in the southern Kattegat reach maturity for the first time generally at a size of ca. 20—30 cm. and at an age of 3—5 years, we must suppose that mature specimens of a length of 40 cm. or above are of a very considerable age as far as they have grown up in this water.

Table 43. Rate of Growth of mature female plaice in the southern Kattegat. Exper. No. 14 A. October 1904.

Date liberated	Month recovered	Period between Liberation and Recovery	Average increase	No. of specimens measured	Average initial length
1904. October 29.	1905 February	4 months	1·0	1	36
	» March	5 »	0·3	3	34·5
	» April	6 »	0·0	2	31
	» May	7 »	0·1	5	32·2
	» June	8 »	2·0	1	26
	» July	9 »	1·0	2	32·5
	» November	13 »	2·0	1	33
	1906 January	15 »	2·0	1	35
	» February	16 »	2·5	1	29

B. Migrations of Plaice.

Long ago the fishermen have experienced that the plaice undertake migrations, and they have formed different hypotheses about the characters, extent and causes of these migrations. Some of these hypotheses are mentioned by the older authors who treated the question about the migration of the plaice. Krøyer[1] writes for instance on the basis of the fishermen's experiences that the plaice twice a year migrate out into deeper water, namely in warmest summer and coldest winter, and that they likewise twice a year approach the coasts, namely in spring and autumn. As will be mentioned later on, the Danish marking experiments in 1903—1905 have essentially confirmed this view and have in no way been at variance with it.

By the systematical investigation of the frequency and distribution of the various age-groups of plaice, which have been carried on in the North-European waters in the last decennaries some light has been thrown over the migration of the plaice. One of the most principal facts which has been revealed is that the youngest bottom-stages of the plaice are only met with on quite shallow water close to the shore. While the grown up plaice occur almost everywhere in our waters from the coasts to 50 fms. or exceptionally to 100 fms. depth, the youngest bottom stages are in the main restricted to depths below one fathom and are rarely met with in a few fathoms depth[2]. When

[1] Henrik Krøyer: "Danmarks Fiske" Bd. II. Kjøbenhavn 1843—45, p. 272.

[2] Particular conditions exist in the true Baltic Sea where specimens of the 0-Group are very rare in shallow water, below 4 meters, but fairly numerous at depths from ca. 10—40 meters (according to the recent investigations of the "Thor").

this has been ascertained, we must conclude that the plaice which occur far from the coast must have undertaken long migrations previously. By investigating the distribution of the 0-Group, the I-Group, the II-Group, etc., it has also been found that gradually as the plaice increase in size they move out into greater depths and thereby enlarge their area of distribution.

Among other information concerning the migration of the plaice, which has been obtained by the systematical investigation of the distribution of the different age-groups, it should be mentioned that the plaice in the Lim Fjord come from the North Sea. Dr. PETERSEN has namely found that the youngest bottom-stages immigrate through the Tyborøn Canal, and gradually as the plaice increase in size they migrate further eastward. The youngest bottom stages are wanting, or at any rate very rare, in those parts of the Lim Fjord where the great plaice-fisheries are carried on: Kaas Bredning, Livø Bredning etc.

In the marking experiments, which were commenced in the North-European waters in 1887 by Dr. PETERSEN[1], as a link in the rational investigations of the stock of food-fishes in the sea, and which in later years, after the beginning of the international cooperation for the study of the sea, have been carried on to a great extent, much light has been thrown upon the migratory tendency of the plaice, and as a general result of these investigations it may be said, I think, that the plaice is much more a fish of migratory habits than was believed formerly by most of the older naturalists.

With respect to the special information about the migrations, which the Danish experiments in 1903—1905 have afforded, the summary below must be referred to.

While it on one hand should be remembered that the number of plaice captured in a certain area depend highly on the intensity with which the fishing is carried on, it must on the other hand not be forgotten that the intensity with which the fishery is carried on in the different areas depend essentially upon the migration of the plaice.

1. Migration of Plaice liberated in the Horns Reef Area.

In order to obtain a view over the migrations of the plaice through the marking experiments it is not sufficient to know at which places and at what time the marked plaice are recovered. It is also necessary to know at which places and with what intensity the fishery is carried on in the different seasons. Information in the latter direction is not difficult to obtain as far as the Danish plaice fishing in the Horns Reef area is concerned, owing to the fact that the "Dansk Fiskeritidende" states in weekly accounts where the cutters are fishing.

A view over the places where the cutters, which take their catch to Esbjerg, have been fishing during the years 1903—1905 is represented in Table 44. As the great majority of the recovered marked specimens in the Danish experiments have been captured by the Danish cutters, it is of less importance to us that it has not been investigated on which grounds the English and German trawlers have been fishing during the different seasons.

Table 44. Table showing the Localities, where the Esbjerg Cutters have been fishing in 1903—1905.

Date			Locality	No. of Cutters	Remarks
1903	February	14—20	SSW of Vyl. 12—14 fms.	2	
»	March	1— 7	SW of Vyl L. V.	5	
»	»	8—14	6—10 miles SSW of Vyl L. V. 12—14 fms.	About the whole fleet	
»	»	»	60 miles W of Vyl L. V. 23 fms.	1	No yield
»	»	15—21	10—11 miles SW of Vyl L. V.	The whole fleet	

[1] C. G. JOH. PETERSEN: Om de praktisk videnskabelige Undersøgelser i de danske Have i Aarene 1887—1888. Fiskeri-Beretning for 1888—1889. København 1890.

Table 44. Continued.

Date			Locality	No. of Cutters	Remarks
1903	March	22 28	4—6 miles SW of Vyl L. V.	c. 80 (The whole fleet)	Stormy weather
		29—	4—6 miles SW of Vyl L. V.	c. 80 (The whole fleet)	
	April	4			
	»	12—18	2—3 miles NW of Slugen. 8—9 fms.	40—50	
	»	19—25	Northern part of Slugen or SE of Vyl Slugen.	50—60 30	
		26—	3—4 miles SW of Slugen	40—50	
	May	2			
			3—4 miles WNW of Graadeep.	8—9	
			WNW of Graadeep or N of Horns Reef	20—30	
		3—9	Slugen — Kærgaarde — N of Horns Reef	The whole fleet	
		10—16	Slugen — Kærgaarde	Most of the Cutters	
	»	»	Off Nymindegab	Several	
	»	»	At Vyl	Several	
		»	Off List	10—11	
	»	»	Off Fjaltring (S of Bovbjerg)	Some	
	»	17—30	Slugen — Kærgaarde	15—16	Bad weather
		31—	20 miles SW of Graadeep	5—6	Bad weather
	June	6			
	»	7—13	At Vyl and N of Horns Reef	Most of the Cutters	
			30 miles SSW of Vyl L. V.	Some	
			NW of Horns Reef L. V.	a few	
		14—20	50 miles WSW of Graadep	30	
		»	Near Vyl	Many	
	»	»	WNW of Vyl	Some	
			Off Nymindegab	Several	
	»	21—27	20—30 miles WSW of Graadeep	10—12	
		»	50 miles WSW of Graadeep	40—50	
	»	»	30 miles WSW of Graadeep	40—50	
	»	»	Near Vyl	Several	
	»	29—	30—60 miles WSW of Graadeep	Most of the Cutters	
	July	4			
	»		NNW of Slugen	Some	
		12—18	WSW of Graadeep, until 50 miles distant	The whole fleet	
	»	19—25	50—80 miles WSW of Graadeep	90	
		26—	50—60 miles WSW of Graadeep	70	
	August	1			
	»	»	NNW of Horns Reef	Several	
		2— 8		No Cutters fishing	Stormy weather
		9—15	20—25 miles NW of Horns Reef L. V. 17—20 fms.	The whole fleet	
		16—29	15—20 miles NW of Horns Reef L. V.	15—20	Stormy weather
		30—	40—50 miles WSW of Graadep	c. 30	
	September	5			
	»	6—12	WSW of Graadeep or 15—20 miles NW of Horns Reef L. V.	60—70	
		»	Off Husby	2	No yield
	»	13—26	NW of Horns Reef L. V.	20—30	Several cutters go to the Kattegat
			Off Husby	Most of the Cutters	
		27—	Nymindegab — Husby	Most of the Cutters	
	October	3			
	»		Husby — Bovbjerg	10—15	
			NW of Horns Reef L. V.	a few	Bad weather almost the whole month
			Slugen	a few	
		4—31	Graadeep or in that neighbourhood	Several	
	November	1— 7	N of Graadeep	Most of the Cutters	The fishery from small boats in the Graadeep inshore-waters begins
			Near Vyl L. V.	a few	
		8—14		No Cutters fishing	Bad weather
		15—21	Esperance Bay (S of Blaavand)	10—12	

Table 44. Continued.

Date			Locality	No. of Cutters	Remarks
1904	February March	25— 5	6 miles S of Vyl	3	
»	»	»	Near Vyl	12—14	
»	»	»	Slugen	1	
»	»	12—19	6—10 miles SW of Slugen	8—10	
»	»	»	SW of Slugen. — Near Vyl	7—8	
»	»	20—26	S or SW of Vyl L. V.	Most of the Cutters	
»	»	»	Slugen — Kærgaarde	Several	
»	»	»	SW of Slugen	Several	
»	»	»	Off List	a few	No yield
»	»	27— April 9		No Cutters fishing	Stormy weather
»	»	10—16	4 miles N of Slugen	c. 10	
»	»	»	Near Vyl	Several	
»	»	17—23	Esperance Bay (S of Blaavand)	Most of the Cutters	
»	»	»	20 miles SW of Graadeep	15—20	
»	»	»	N of Horns Reef	some	
»	»	24—30	20 m. SW of Graadeep. — Esperance Bay (S of Blaavand)	60	
»	»	»	Southern part of Slugen	25—30	
»	May	1— 7	Slugen — Graadeep bell-buoy	60—70	
»	»	»	N and NW of Horns Reef	25—30	
»	»	»	S of Vyl	a few	
»	»	8—14	Off List	60—70	
»	»	»	Graadeep bell-buoy	c. 20	
»	»	»	20 miles SW of Graadeep	a few	
»	»	»	N of Horns Reef	Several	
»	»	15—21	Red Cliff Bank	20—25	
»	»	»	Off Sylt	c. 10	Stormy weather
»	»	»	SW of Slugen	8—10	Stormy weather
»	»	»	29 miles SW of Graadeep	c. 2	Stormy weather
»	»	22—28	Red Cliff Bank	20—30	
»	»	»	Off Sønderho (Fanø)	c. 10	
»	»	»	Off List	a few	
»	»	»	Horns Reef — Kærgaarde — along the shore	Most of the Cutters	
»	»	30— June 4	Slugen — Nymindegab	50—60	
»	»	»	20—25 miles SW of Graadeep	20—30	
»	»	»	Near Vyl	c. 20	
»	»	»	Off Sønderho (Fanø)	c. 10	
»	»	5—11	Off Sønderho (Fanø)	8—10	
»	»	»	Slugen — Nymindegab	20—30	
»	»	»	Red Cliff Bank	c. 20	
»	»	12—18	SE of Vyl. 10 fms.	20—30	
»	»	»	Slugen — Nymindegab	30—40	
»	»	»	W by N of Blaabjerg.	6—7	
»	»	»	Off Amrum	1	
»	»	19—30	36 miles SW of Graadeep	2 (most Cutters in harbour)	Stormy weather
»	July	1— 9	30—36 miles SW of Graadeep	50—60	
»	»	»	SW of Graadeep	20—30	
»	»	»	Off Blaabjerg — Kærgaarde	a few	
»	»	10—16	Off Haurvig — Søndervig	Most of the Cutters	
»	»	»	W of Horns Reef L. V.	c. 10	
»	»	»	SW of Graadeep	3—4	
»	»	»	Off Amrum	a few	
»	»	»	21 miles SW of Horns Reef L. V.	1	
»	»	17—23	Off Husby	c. 10	
»	»	»	20 miles W of Amrum	5—6	
»	»	»	45 miles W by S of Vyl L. V.	2	
»	»	»	Klegod — Husby	20	
»	»	24—30	NW of Helgoland. 16—19 fms.	c. 10	

Table 44. Continued.

Date			Locality	No. of Cutters	Remarks
1904	July	24—30	Off Husby. 15 miles from shore	Most of the Cutters	
»	»	»	Near Horns Reef L. V.	c. 8	
»	August	1— 6	Off Ringkøbing — Husby	Most of the Cutters	Small yield
»	»	»	Near Horns Reef L. V.	c. 10	
»	»	»	15 miles NW of Horns Reef L. V.	5—7	
»	»	7—13	Near Horns Reef L. V.	Several	Stormy weather
»	»	»	Off Søndervig	5—6	
»	»	14—20	Off Haurvig — Søndervig	The whole fleet	Stormy weather
»	»	21—27	7—8 miles off Klegod and Husby. 12—13 fms.	Most of the Cutters	
»	»	»	Northend of Slugen	12—15	
»	»	28—	Northend of Slugen	14—15	
	September	3			
»	»	»	Off Klegod and Sønder-Lyngvig or near Horns Reef L. V.	30	
»	»	4—10	Off Klegod — Husby	30—40	
»	»	»	Slugen	10—15	
»	»	»	Off Kærgaarde — Nymindegab	40—50	
»	»	»	Off Klegod	15—20	
»	»	»	NW of Horns Reef L. V.	a few	
»	»	11—17	Nymindegab — Aargab, near shore	30—40	
»	»	»	3 miles off Klegod — Husby	30—40	
»	»	»	Slugen	3—4	
»	»	18—24	Off Haurvig — Husby	c. 20	
»	»	»	Blaabjerg — Bjerregaard	20—30	
»	»	»	Slugen	c. 20	
»	»	25—	Slugen — Blaabjerg	25—30	
	October	1			
»	»	»	Along the coast, N of Kærgaarde	30—35	
»	»	»	Off Klegod	a few	
»	»	»	Off Blaavands Point	1	
»	»	2— 8	Along the coast, N of Kærgaarde	20	
»	»	»	Slugen	c. 10	Bad weather
»	»	»	Off Klegod	4	
»	»	9—15	Slugen — Blaabjerg	3	
»	»	»	8—10 miles W of Blaabjerg	c. 30	
»	»	16—22	Kærgaarde — Blaabjerg	30—40	
»	»	»	10—15 miles NW of Slugen	15	
»	»	23—29	Off Nymindegab, 8—10 miles from shore	35—40	
»	»	»	13 miles NNE of Horns Reef L. V.	a few	
»	»	30—	25 miles NNW of Slugen	60—70	
	November	5			
	»	»	10 miles NNE of Horns Reef L. V.	20	
	»	6—12		No Cutters fishing	Stormy weather
	»	13—19	Esperance Bay (S of Blaavand)	14—15	
»	»	»	25 miles NNW of Slugen	25—30	
	»	»	10 miles N by E of Horns Reef L. V.	6—7	
»	»	20—26	20 miles NNW of Slugen	7—8	Almost no yield
1905	February	12—18	S and N of Vyl	a few	Small yield
»	»	19—25	Vyl, Esperance Bay — Slugen, off Nymindegab	14—15	Almost no yield
	»	26—		No Cutters fishing	Stormy weather
	March	18			
»	»	19—25	10—15 miles SW of Vyl	70—80	
»	»	»	16 miles W of Vyl L. V.	1	
	»	26—	20—25 miles SW of Vyl L. V.	60—70	
	April	1			
	»	»	S of Slugen	1	
»	»	»	26 miles NW by N of Slugen	1	
	»	»	10—12 miles SW of Vyl	30	
		2— 8	10—14 miles SSW of Vyl	70	
»	»	9—15	NW of Red Cliff Light	40	
»	»	»	SW of Vyl L. V.	30	

Table 44. Continued.

Date			Locality	No. of Cutters	Remarks
1905	April	9—15	SW of Horns Reef L. V.	20—30	
»	»	16—22	NW of Red Cliff. — SW of Vyl	10—15	
»	»	»	Graadeep from the bell-buoy to Slugen	Most of the Cutters	
»	»	»	30 miles SW of Graadeep	4—5	
»	»	»	SE of Vyl L. V.	a few	
»	»	23—29	Graadeep — southern part of Slugen — Cancer	60—70	
»	»	»	SW of Vyl	4—5	
»	»	»	Horns Reef L. V.	1	
»	»	»	Northend of Slugen	some	
»	»	30	Near Vyl	40—50	
	May	6			
»	»	»	Slugen and S and N of Blaavands Point	30—40	
»	»	»	At Cancer	a few	
»	»	»	Off List	a few	
»	»	7—13	S or W of Vyl	30—40	
»	»	»	Off Sønderho	10	
»	»	»	N of Horns Reef L. V.	1	
»	»	»	The bell-buoy of the Cancer grounds	Most of the Cutters	
»	»	»	10—15 miles W of List	15—20	
»	»	»	Off Kærgaarde	c. 10	
»	»	»	15 miles NW of Slugen	8—10	
»	»	14—20	SW of the Cancer grounds	Most of the Cutters	
»	»	»	Blaabjerg — Kærgaarde	15—16	
»	»	»	Off List	c. 10	
»	»	»	Northend of Slugen	20—25	
»	»	»	13—14 miles NW of Slugen	15—20	
»	»	21—27	Near Vyl	c. 20	
»	»	»	Graadeep, 5 miles from the bell-buoy	30—40	
»	»	»	Northern part of Slugen	some	
»	»	»	Graadeep. — Off Sønderho. — Off List	30	
»	»	»	NNW of Slugen	some	
»	»	28—	3 miles N of Slugen	20—25	
	June	3			
»	»	»	Graadeep SW of the bell-buoy	25	
»	»	»	Off Kærgaarde	25—30	
»	»	»	14—15 miles NNW of Slugen	c. 10	
»	»	»	SE of Vyl L. V.	20—25	
»	»	4—10	S of Vyl L. V.	50—60	
»	»	»	SW of Graadeep, near Vyl	c. 50	
»	»	»	SW of Vyl	c. 10	
»	»	»	Northend of Slugen	a few	
»	»	11—17	Off Kærgaarde	25	
»	»	»	Off Red Cliff and Amrum	20—30	
»	»	»	S of Vyl	Several	
»	»	»	Northend of Slugen	c. 10	
»	»	»	N of Horns Reef L. V.	a few	
»	»	»	Off Aargab	a few	
»	»	18—24	Off Kærgaarde	20—25	
»	»	»	Off Red Cliff	c. 20	strong gale
»	»	»	S of Vyl L. V.	10—12	strong gale
»	»	»	NW of Vyl	a few	
»	»	25—	W of Red Cliff. — S of Vyl L. V.	40—50	
	July	1			
»	»	»	Amrum — Red Cliff	10—20	
»	»	»	12 miles W of Vyl L. V.	15—20	
»	»	»	Off Haurvig	c. 20	
»	»	»	NW of Horns Reef L. V.	1	
»	»	2— 8	S of Vyl, towards Helgoland	Most of the Cutters	
»	»	»	10 miles NW of Slugen	20—30	
»	»	»	At Horns Reef L. V. and W of that	c. 20	

Table 44. Continued

Date			Locality	No. of Cutters	Remarks
1905	July	2— 8	NW of Slugen. — S of Horns Reef L. V.	30—40	
»	»	9—15	6—8 miles SW of Vyl L. V.	25	
»	»	»	Off Blaabjerg	14—15	
»	»	»	Off Husby	12—14	
»	»	»	Off Klegod	Several	
»	»	»	N of Horns Reef L. V.	4	
»	»	16—22	Haurvig — Aargab	30—40	
»	»	»	30 miles SW of Graadeep	10	
»	»	»	20—25 miles N of Slugen	some	
»	»	»	Off Aargab	25—20	
»	»	23—29	Aargab — Haurvig	Most of the Cutters	
»		»	NNW of Slugen	20—30	
»	»	»	25 miles SW of Graadeep	Several	
»	»	»	NW of Horns Reef L. V.	1	
»	»	30— August 5	Northend of Slugen. — Aargab — Haurvig	90—100	
»	»	»	Off Husby	a few	
»	»	»	30—50 miles SW of Graadeep	14—15	
	»	6—12		No Cutters fishing	Heavy gales
		13—19	SW of Horns Reef L. V.	2	
»	»	»	20—30 miles NW by N of Slugen	Most of the Cutters	
		»	20 miles W of Horns Reef L. V.	30—40	
	»	20—26	NW of Slugen	Most of the Cutters	
»	»	»	Off Husby	Several	
»	»	27— September 2	20 miles NNW of Slugen	Most of the Cutters	
	»	3— 9	16—20 miles N by W of Slugen	Most of the Cutters	
	»	»	Off Nørre-Lyngvig	a few	
»	»	10—16	20—25 miles N by W of Slugen	50—60	
»	»	17—23	N by W of Slugen	Most of the Cutters	
»	»	»	Off Kærgaarde	3—4	
»	»	»	Kærgaarde — Nymindegab, close to the shore	c. 20	
»	»	»	Off Sønder-Lyngvig	1	
»	»	24—30	Kærgaarde — Nymindegab, close to the shore	c. 10	
»	»	»	Klegod — Søndervig	20—25	
»	»	»	20 miles N by W of Slugen	40—50	
	October	1— 7		Practically no fishing	Stormy weather
	»	8—14	20 miles NW of Slugen	Most of the Cutters	
		»	SW of Nymindegab, near the shore	c. 20	
		15—21	20 miles N by W of Slugen	50	
	»	»	Northend of Slugen. — Kærgaarde — Sønder-Lyngvig	some	No yield
		22—28	20—30 miles N by W of Slugen	60—70	
	November	29— 4	Off Red Cliff	a few	No yield
		5—11	N by W of Slugen	10—20	No yield
		12—18	S of Horns Reef. — N of Horns Reef	30—40	No yield
			NE of Horns Reef L. V.	2	

It may be seen from Table 44, that the cutters keep about the same grounds during the same season in the different years.

The fishery around or SW of Vyl light-ship commences at the end of February or at the beginning of March. Later on, in March or April, a great many of the cutters move into more shallow water and approach the Graadeep and Cancer. Yet in April only a few cutters sail north of Horns Reef. In May and June many cutters go north of the Reef, where they remain in the beginning on rather shallow water below 25 meters, while they later on generally fish at depths from 25—40 meters. The cutters

remaining south of the Reef now fish the grounds further south off Amrum and Sylt, or stand further to sea.

During the summer months July, August and partly in September, when the water is warmest, very little fishing takes place on the grounds near the Horns Reef below 20 meters depth. The majority of the cutters are fishing somewhat further out partly off the stretch Haurvig—Aargab—Sønder Lyngvig —Søndervig—Husby—Bovbjerg, partly at Horns Reef light-ship or NW. of that, and partly in a south-western direction from Graadeep, ca. 30—80 miles at sea. At the end of September or in the beginning of October the cutters recommence to gather at the Horns Reef grounds, where they are now fishing, partly north of, partly south of the Reef, until the cutter fishery ends in the month of November.

In November and December a rather considerable plaice fishery takes place in the inshore waters at Esbjerg from small boats. This fishery ceases when the winter cold sets in.

The question is now: what conditions cause the rather uniform movements of the fleet of fishing vessels in the different years. It should be noticed that when the cutters in spring, in February or in the beginning of March, start the fishery, they do not begin on the quite shallow water at Graadeep and Cancer, but they sail further out and begin S. or SW. of Vyl light-ship. Though the unsettled weather of this season might tempt the cutters to look for the fish as near the harbour as possible, they go several miles out. Thus the fishermen must evidently have experienced, that they may reckon with a richer catch here than on the shallow grounds at Cancer and Graadeep. Not until they have been fishing around Vyl for a time do they sail into the more shallow water at Graadeep, Cancer and Slugen. That the cutter's movement towards the more shallow grounds is owing to a corresponding movement of the plaice, we have every reason to believe, as it has been ascertained, that a very great portion of the plaice which in spring were marked at Vyl or somewhat further at sea have later on been recovered in the shallow water at Cancer, Graadeep and Slugen (see Contributions I, Pl. XI and XII and this paper Fig. 3 p. 16 and Pl. V and VI).

When the fishermen in the beginning of the summer generally leave the grounds at Horns Reef to stand further at sea we might imagine the following reasons to account for this:

1) That the stock of marketable fish at the Horns Reef had been fished up.
2) That the stock of marketable fish was migrating outward into deeper water.

That the stock of marketable plaice at Horns Reef is not quite destroyed by the spring fishery is proved by the Danish marking experiments. A not inconsiderable number of the specimens marked at the Horns Reef grounds escape recapture at these grounds in the spring, while they are partly recovered in deeper water in summer. Thus the cutter fishery in summer is at least partly based on a stock coming from the Horns Reef. In this way we must suppose the migrations of this stock to influence the cutter's movements.

It would also appear from the trawling experiments carried on by the Danish, English and German research steamers, as if the quantity of plaice on the off-shore grounds in the Horns Reef area at depths above 30 meters mainly depend on the stock of young plaice that in the summer months comes from the shallow water. In March, April and May there are very few plaice on the off-shore grounds, and the Danish cutters do not fish there. In July, August and September there are relatively many plaice on the off-shore grounds, which are now visited by the Danish cutters (conf. GARSTANG: Provisional Report on the Natural History of the Plaice etc. Rapports et Procès-Verbaux, vol. III, 1905).

In July of 1903 the majority of the Esbjerg cutters fished 30—80 miles WSW. of Graadeep, but they did not catch more than one of the Danish marked fish here (see Contributions I, Pl. XI and XII). A few cutters fished on the other hand N. or NNE. of Horns Reef light-ship, and caught two marked fish. The trawlers captured 7 of the marked fish in the same month, and most of these were recovered

NW. of Horns Reef light-ship. Thus it appears as if the plaice have moved mainly in a north-western direction when they have migrated out towards greater depths.

The Figures 2 (p. 14), 3 (p. 16), 6 (p. 78) and 7 (p. 79) offer a view over the migrations of plaice which were liberated in the Horns Reef area in February, 1904. It is of great interest to notice where the marked fish were caught during the month of July (see the arrow heads marked 5 on Fig. 2, 3, 6 and 7). The cutters fished partly SW. of Horns Reef, 30—40 miles or more from shore, partly northward, off the area Nymindegab — Bovbjerg. In the former places no marked plaice were recovered, in the latter 8 specimens. Thus it is quite evident that the plaice migrating away from the Horns Reef grounds have moved in the main in north-western and northern direction as in the summer of 1903.

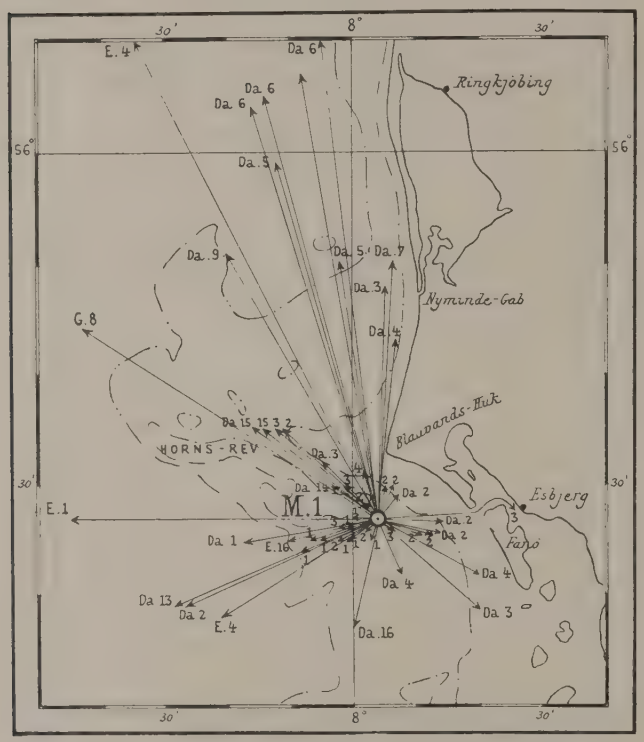

Fig. 6. Marking experiment with plaice. No. 1. 1904. February.

Turning to the marking experiments No. 8, 9 and 10 in April, 1905 (Pl. III, V and VI) it will be seen also that far more marked fish were recovered during the summer period, July, August, September, north-west than south-west of Horns Reef (arrow heads marked 3, 4 and 5), and yet the cutters seem to have been fishing as much south-west as north-west of Horns Reef. It is also here plain that the fish from Horns Reef have moved in north-western direction in summer. The cutters, which in summer have fished south or south-west of the Reef, have probably not caught plaice coming from the Horns Reef, but more likely fish migrating from south.

In the beginning of autumn the cutters leave the deeper water and start again for the Horns Reef grounds. This movement is probably due to the following three causes.

1) That some of the plaice have returned from the off-shore grounds.

This hypothesis is in accordance with the fact that the marked fish may sometimes in autumn be recovered near the coast in more shallow water than that in which they were liberated, while they are in summer constantly caught further in the offing. During the inshore fishing in Graadeep in the month of November, 1903, 3 specimens were thus recovered of those liberated in spring at Vyl or at Horns Reef. This points undoubtedly in the direction that at any rate some of the plaice gathering in the Graadeep inshore waters in autumn come from deeper water in the very North Sea.

It is worthy of note that three specimens recovered close to the shore in October—November had only an average length of 24 cm., while 6 specimens caught on the off-shore grounds in September—December had an average length of 29 cm. We see here an illustration of the fact that it is especially the larger specimens which remain on the off-shore grounds in autumn and winter.

2) That some of the plaice which in the course of the summer have reached a marketable size at the Horns Reef grounds have remained there.

3) That the unsettled weather tempts the cutters to look for their catch as near the harbour as possible.

Some of the marketable plaice in the Graadeep inshore waters that escape recovery during the autumn fishing migrate probably in the beginning of the winter out into somewhat deeper water. "With the first day of frost the plaice disappear", says the Esbjerg fisherman. In the marking experiment No. 11 in the Graadeep inshore waters on September 29, 1905, 3 specimens were recaptured in November near the place of liberation. But in the beginning of spring, 1906, in March and April, all the recovered specimens — three in all — were taken out in the very North Sea, one specimen even rather far at sea. Thus it is quite evident that these specimens in winter have migrated towards deeper water (see Table 22 p. 58).

At the Horns Reef grounds most of the plaice probably squeeze themselves into the bottom in

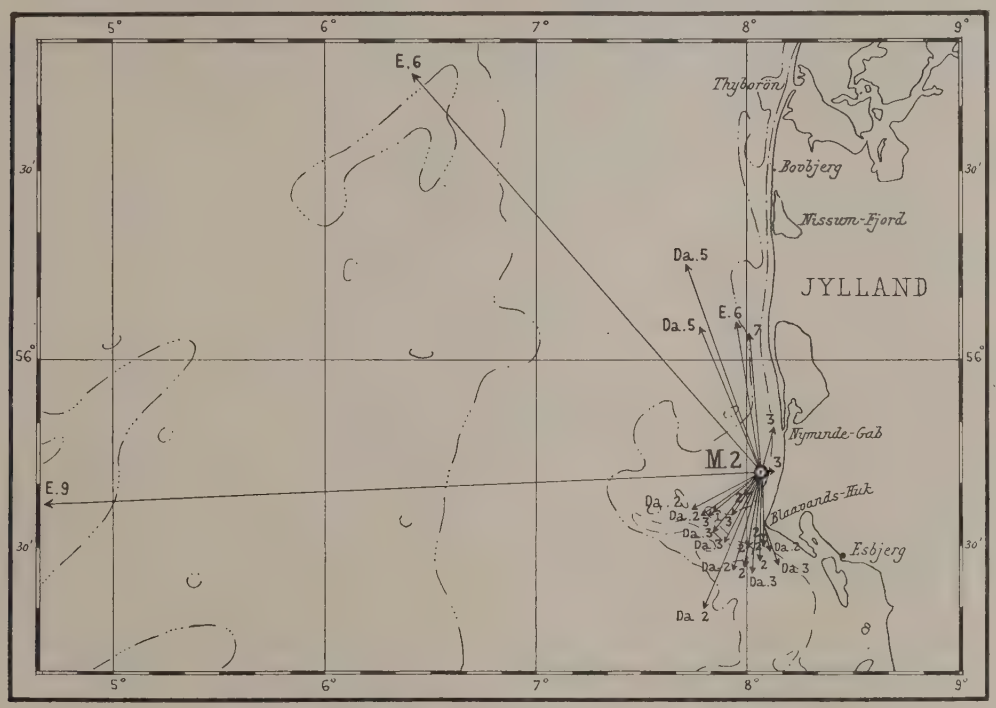

Fig. 7. Marking experiment with plaice. No. 2. 1904. February.

the beginning of winter. When the Esbjerg cutters in the middle of winter look for plaice at the Horns Reef grounds they hardly catch any. Some trawling experiments from the "Thor" in which an iron chain was attached to the ground-rope of the otter trawl, have proved, however, that marketable plaice may also be found in numbers on these grounds in winter.

Thus the migration of the plaice in the Horns Reef area may shortly be characterized as follows: The plaice show on the whole an inclination to migrate out into deeper water as they increase in size. But the migrations outward are not continual: In certain periods the fish seek shallow water.

In the spring months, March and April, the stock of marketable plaice shows a tendency to move into more shallow water. In April and May a great many specimens are caught at ca. 10—25 meters' depth. In the month of June the plaice begin to migrate out into greater depths, essentially in a north-western direction. In July and August the fish is mainly looked for in depths between 25—40 meters.

While the migrations towards the off-shore grounds probably continue in autumn as far as most

of the larger specimens are concerned, we may trace a tendency in the smaller specimens to seek more shallow water.

In winter some of the plaice migrate outward from the shallow grounds, but a great many stay probably in shallow water and squeeze themselves hard into the bottom.

From the summary below it may be seen that of 754 plaice recovered in the marking and transplantation experiments in the Horns Reef area in 1903, 1904 and 1905, 751 were recaptured in the North Sea, 2 in the Skagerak and 1 in the Kattegat. From this it appears clearly that the rich stock of young fish in the Horns Reef area does not play any considerable rôle for the renewal of the stock of marketable plaice in the Skagerak and Kattegat.

Table 45. Table showing the number of marked plaice caught in different waters and originating from the marking and transplantation experiments in the Horns Reef area, 1903, 1904, 1905.

	Total No. caught, Place of recovery known	Caught in the North Sea	Caught in the Skagerak	Caught in the Kattegat
Mark. exper., 1903	321	321	0	0
Mark. & transpl. exper., 1904.	169	167	1	1
Mark. exper., 1905	264	263	1	0
Total No....	754	751	2	1
Percentage...	100%	99·6	0·3	0·1

2. Migrations of plaice liberated in the Hanstholm—Søndervig area.

In the Hanstholm—Søndervig area between 56° and 57° N. lat. only a few smaller marking experiments have been undertaken, viz. three in April of 1903 (see Contributions I Pl. X) and one in March of 1905 (Pl. V, Experiment No. 5). As the most characteristic feature of these experiments it should be mentioned that the plaice here show a marked tendency to undertake long migrations in proportionately short time.

3. Migrations of plaice liberated in the Skagerak and the Kattegat.

In the Skagerak several marking experiments with plaice have been carried on. In studying the nature of the migrations of the plaice liberated in the Skagerak, it should be remembered, that the Danish cutter-fishery in the Skagerak comprises only the period from April to October and that foreign trawlers fish only very little in the southern Skagerak off the NW. Coast of Jutland at depths below 50 meters (on account of the stony condition of the bottom). Neither is any plaice fishery worthy of mention carried on near the coasts in the months from November to March except on the stretch Skagen—Spirbakken. Thus we cannot expect many recaptures of marked plaice from the Skagerak during these months.

A table recording where and when the cutters from Frederikshavn have carried on the fishery in the North Sea and the Skagerak is represented below (Table 46). This Table does not contain any information regarding the depths at which the cutters have been fishing, wherefore it is of less importance than the corresponding summary for the Esbjerg cutters. The Table has been worked out from the records in "Dansk Fiskeritidende". A supplementary Table showing at what depths a few of the cutters from Frederikshavn have been fishing is, however, adjoined.

Table 46. Table showing the Localities in the North Sea and the Skagerak, where the Frederikshavn cutters have been fishing in 1905.

Date			Locality	No. of Cutters
1905	April	16—22	Off Hirshals	a few
»	»	23—	Tversted. — Hirshals. — Bulbjerg	40
»	May	6		
»	»	7—13	The Horns Reef Area	1
»	»	»	Jutlands Reef	1
»	»	»	Hirshals Rende	20—25
»	»	14—20	Hanstholm. — Hirshals. — Tversted	35—40
»	»	»	Large Reef, W of Løkken	3—4
»	»	»	Horns Reef	2
»	»	21—27	Horns Reef	1
»	»	28—	Tversted — Hirshals and further westward	30—40
»	June	3		
»	»	»	Horns Reef	4—5
»	»	4—10	At Hirshals and further out in deeper water	20—25
»	»	»	The Horns Reef Area	6—7
»	»	11—17	Large Reef, W of Løkken	10
»	»	»	Horns Reef	a few
»	»	18—24	Off the west-coast of Jutland	25
»	»	»	Horns Reef	2
»	»	25—	Tversted. — Hirshals. — W of Løkken	50
»	July	1		
»	»	2— 8	Off the west-coast of Jutland	10
»	»	9—15	Tversted — Hanstholm	25—30
»	»	23—29	Off Bovbjerg	3
»	»	30—	Tversted. — Hirshals and further westward	20
»	August	5		
»	»	6—12	Off Tversted. — Hirshals. — Hanstholm	25—30
»	»	13—19	Off the west-coast of Jutland	c. 20
»	»	20—26	W of Hirshals	15—20
»	»	27—	W of Hirshals on the Reef	a few
»	September	2		
»	»	3— 9	Hirshals — Tversted	15
»	»	10—16	Tversted and further westward	10—15
»	»	17—23	Hirshals — Tversted	10
»	»	24—30	Off the west-coast of Jutland	4—5
»	»	»	North Sea	several
»	October	1— 7	North of Skagen	a few
»	»	8—14	North of Skagen	3—4
»	»	15—21	Skagen — Spirbakken	4—5

Table 47. Table showing the Localities and Depths where some of the Cutters from Frederikshavn have been fishing in 1905. Each statement comprises only one Cutter.

(After cummunication from Mr. Cloos Lorentzen, Frederikshavn.)

Date			Locality	Depth
1905	April	10—15	NE of Hirshals	10 fms.
»	May	3	20 miles NW of Hirshals	20 »
»	»	7— 8	NNW of Hirshals	21 »
»	»	17	NW of Hirshals	20 »
»	»	17—18	N of Hirshals	16—18 »
»	»	25—27	20 miles NW of Hirshals	20 »
»	»	28—31	NW of Hirshals. 16 miles from shore	22 »

Table 47. Continued.

Date			Locality	Depth
1905	June	2— 3	NW of Hirshals. 8 miles from shore	23 fms.
»	»	6— 7	NW of Hirshals. E of the Reef	22 »
»	»	7— 8	Off Rubjerg Knude	14 »
»	»	15—16	NNW of Hirshals	20 »
»	»	15—17	NNW of Hirshals	25—30 »
»	July	2	8 miles WNW of Hirshals	14 »
»	»	13	NW of Hirshals	16—17 »
»	»	13—15	NW of Hirshals	19—20 »
»	»	22	NW of Hirshals. NE of the Reef	22 »
»	»	23—24	N of Bulbjerg	20 »
»	»	24	Off Tversted	20 »
»	August	1— 2	NNW of Hirshals. E of the Reef	22—24 »
»	»	»	Off Svinkleven. W of the Reef	26—27 »
»	»	»	NE of Hanstholm	32 »
»	»	4— 5	NE of Hirshals	19 »
»	»	»	NNE of Hanstholm	22 »
»	»	»	NW of Hirshals	38 »
»	»	10	NE of Skagens L. V.	24 »
»	»	»	NW of Hirshals	20 »
»	»	24	Off Hirshals	25 »
»	September	5— 6	NE of Hirshals	14 »
»	»	6— 7	Off Hirshals	20—26 »
»	October	10—11	Off Tversted — Hirshals	6 »
»	»	11—13	Off Kandestederne	5 »

If we regard the charts over the marking experiments in the Skagerak, some characteristic features will quickly be noticed with regard to the migrations of the plaice in this water. In the first instance it is conspicuous that the plaice are only little stationary here. They undertake long migrations in relatively short time, and proportionally many specimens migrate away from this water, partly seeking the Kattegat, partly the North Sea. The experiments No. 3 and 4, March 1905 (Pl. V and VI) as well as the transplantation experiments No. 10 on March 1st, 1904 (Fig. 4 p. 19) show, that a great number of plaice move in the two directions: towards the Kattegat and towards the North Sea.

It would be natural to investigate if it be not particularly during one season that the plaice from the Skagerak emigrate to the Kattegat and during another season that they emigrate to the North Sea. The experiments show, however, that they at any rate in spring migrate in both directions.

Another characteristic feature of the plaice-migrations in the Skagerak is in correspondance with the observations made in the Horns Reef area. In the Skagerak it appears also that the plaice in spring show a marked tendency to migrate to more shallow water while in summer they show a just as marked reversed tendency. This was already experienced in the marking experiments in 1903 and again through the experiments in 1905. On the chart illustrating the experiment No. 4, 1905 (Pl. VI) it will be seen that most of the arrows pointing towards the coast are indicated 2, which means that the plaice were recovered 2 months after liberation, viz. in the month of May. If we regard on the other hand the arrows pointing towards the offshore-grounds we notice almost at them all the indications 3, 4, 5 or 6, which shows, that the fish were recovered during the months June, July, August and September. We might now suppose that the plaice which in summer are recovered on deeper water had already migrated out in spring without being caught, because no fishery was carried on there in spring. It will be seen, however, from Table 47 that the fishery from Frederikshavn takes place partly on deeper water in the Skagerak as early as the month of May.

In the Table below a summary is represented stating in which waters the marked plaice from the marking and transplantation experiments in the Skagerak were recovered. Though not more than 2—3 months have on an average elapsed between the date of liberation and the date of recovery, it will be seen that only 77 % of the recovered marked fish were captured in the Skagerak itself. If we regard the few specimens recovered more than one year after liberation we obtain a still slighter percentage for the Skagerak. Among 9 of such specimens only 5 were recovered in the Skagerak while 2 were caught in the North Sea and 2 in the Kattegat.

While the plaice fishery takes place in the Skagerak only in the period April—October, it is carried on during all seasons in the Kattegat. The fishery goes on with the greatest intensity during the months from March till November, but also during the winther months a rather considerable plaice fishery takes place. In the north-eastern Kattegat

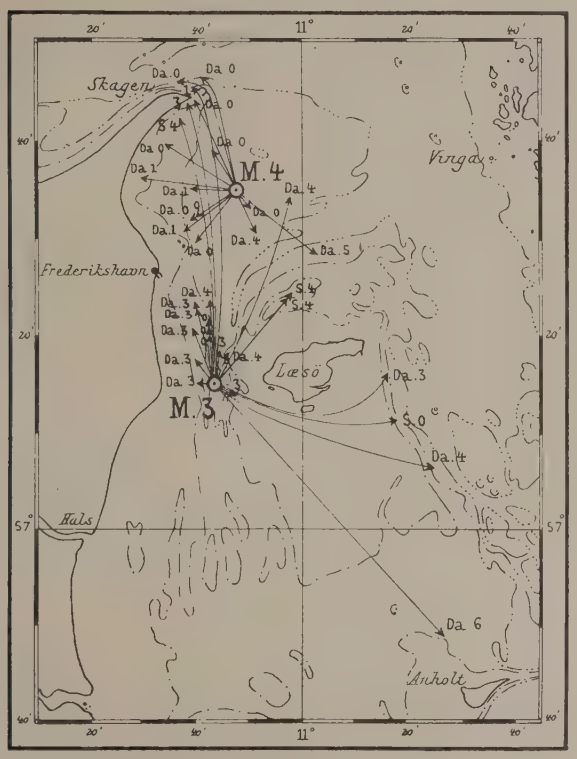

Fig. 8. Marking experiment with plaice. No. 3 and 4. 1904. March.

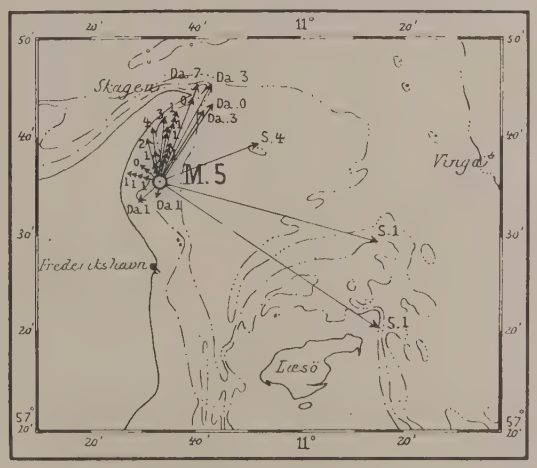

Fig. 9. Marking experiment with plaice. No. 5. 1904. March.

Table 48. Table showing the number of marked plaice caught in different waters and liberated in the Skagerak in the years 1903, 1904 and 1905.

	Total No. caught, Place of recovery known	Caught in the Skagerak	Caught in the North Sea	Caught in the Lim Fjord	Caugth in the Kattegat
Mark. exper. 1903	40	32	7		1
Transpl. exper. 1904....	45	26	11	3	5
Mark. exper. 1905	326	259	33	1	33
Total No.....	411	317	51	4	39
Percentage..	100 %	77·1 %	12·4 %	1·0 %	9·5 %

and in the south-western Kattegat south of a line drawn from Fornæs to Gilbjerghoved the plaice fishery is carried on with considerably less intensity than in the rest of the Kattegat, and it is only in summer

that a considerable plaice fishery is undertaken in the Aalborg Bight. If we compare the charts over the marking experiments in the Kattegat (Fig. 8, 9, 10; Pl. I, II, III, IV) with the charts over the marking experiments in the Skagerak (Pl. V, VI and Contributions I Pl. X) it appears that the plaice on the whole is more stationary in the Kattegat than in the Skagerak. The same may be seen if we compare the charts illustrating the transplantation experiments in the Skagerak and the Kattegat (Fig. 4 p. 19 and Fig. 5 p. 20).

The plaice in the Kattegat seem to be more inclined to undertake long migrations in relatively short time than the plaice in the Horns Reef area, but on the other hand they do not show so strong an inclination to change dwelling place quickly as the plaice in the Skagerak.

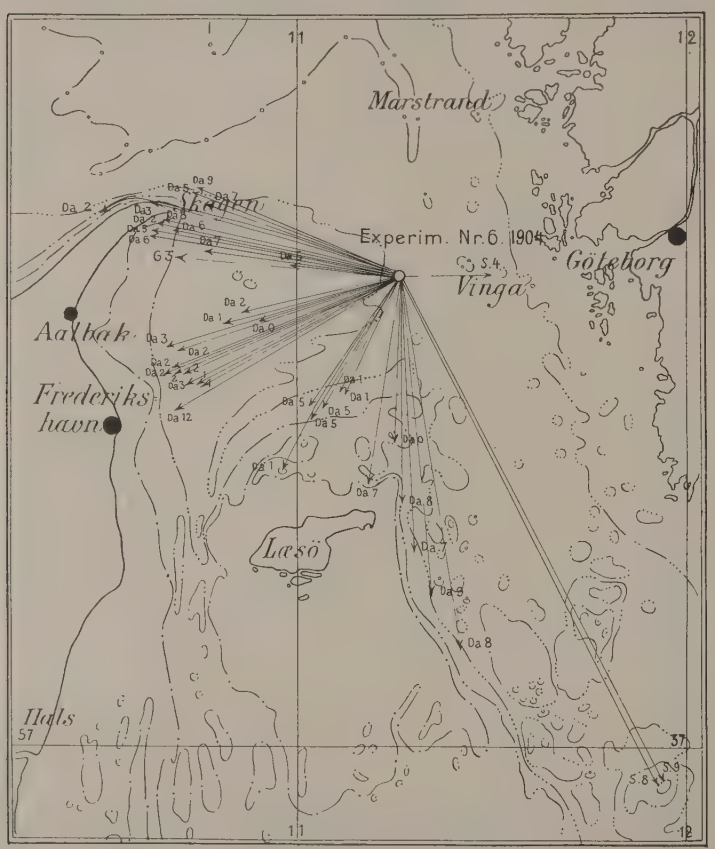

Fig. 10. Marking experiment with plaice. No. 6. 1904. October.

Among other characteristic features of the plaice-migrations in the Kattegat it may be mentioned that a rather extensive northward movement has evidently taken place towards the Skagerak, but apparently no extensive southward movement towards the Belt Sea and Baltic. This is evidently in connection with the fact that the majority of the marked plaice belongs to the northern form which seems to feel more at home under the life conditions in the Skagerak than under the life conditions in the Belt Sea and in the Baltic.

In a separate experiment (14 A.) which was carried on in the south-eastern Kattegat and which only included mature females, exclusively or mainly of the southern dwarf-form, there is on the contrary a distinct southward tendency. Experiment No. 14, which has been undertaken at the same place and at the same time with specimens partly belonging to the northern, partly to the southern form (females mainly of the northern form, males without distinguishment) has given a result very different from that of experiment 14 A. The majority of the specimens is here recovered north of the place of liberation. Thus we hardly commit any error in supposing the majority of the specimens which have here migrated northward to belong to the northern form.

The migrations of plaice of the southern form in the Kattegat are surely very different from those of the northern form, but how far any considerable exchange takes place between the stock in the Belt Sea and the stock in the southern Kattegat has not yet been ascertained.

The tendency which we find in the plaice in the Horns Reef area and the Skagerak to migrate towards more shallow water in spring and out on greater depths in summer may also be traced in the

Kattegat plaice[1]. This appears most plainly in the experiments No. 4 and 5, 1904, and in No. 6 and 7, 1905 (see Fig. 8 and 9 p. 83 and Pl. III and IV).

The experience which many fishermen mean to have made that the plaice show a tendency to move towards more shallow water in autumn (before the spawning has begun) is quite in keeping with the results of the marking experiments in autumn 1904 (see Fig. 10 p. 84 and Pl. I Exper. No. 8).

All the marking experiments in the northern Kattegat point in the direction that the plaice show a disinclination to migrate to the eastern side of the deep channel in the northern Kattegat, as only very few of the marked fish have been recovered there. It is quite true that the fishing here is not carried on with strong intensity, but this is again essentially owing to the fact that the plaice do not show any inclination to immigrate to this area from the Danish rearing grounds. In the Swedish transplantation experiments the plaice has shown a far stronger tendency to migrate from the Swedish to the Danish coast (Trybom l. c.).

In a part of the southern and south-western Kattegat where the plaice fishery is carried on with no strong intensity only a slight number of the marked plaice have been recovered.

It will be seen from the summary below, that 92·3 % of all the recovered marked plaice from the experiments in the Kattegat were recovered in the Kattegat, 6·6 % in the Skagerak, 0·6 % in the North Sea, 0·4 % in the Sound and 0·1 % in the Belt Sea.

Table 49. Table showing the number of marked plaice caught in different waters and liberated in the Kattegat, 1904 and 1905.

	Total No. caught, Place of recovery known	Caught in the Kattegat	Caught in the Belt Sea	Caugth in the Sound	Caught in the Skagerak	Caught in the North Sea
Mark. exper. 1904	305	272		2	28	3
Mark. exper. 1905	498	469	1	1	25	2
Total No....	803	741	1	3	53	5
Percentage..	100 %	92·3 %	0·1 %	0·4 %	6·6 %	0·6 %

Do more plaice migrate from the Skagerak into the Kattegat than vice-versa?[2]

Through the "Thor"s investigations it has been made clear that in the Skagerak there does not exist any stock of plaice belonging to the southern dwarf form which might have immigrated from the southern Kattegat or the Belts and Baltic; but as the plaice living in the northern Kattegat are generally of the same type as those living in the Skagerak a mere investigation of the very plaice in these waters would not enable us to determine further details regarding their native place. Among the different measures we had to adopt in order to obtain information with respect to the exchange of the stock of plaice between the Skagerak and the Kattegat it was provisionally decided to undertake extensive marking experiments in both these waters. The results of such marking experiments are now at hand, and even if no perfectly certain information can be given on the basis of these how far more plaice migrate from the Skagerak to the Kattegat than vice-versa, the experiments have yet afforded very valuable information with respect to the extent of these migrations in both directions.

Thus it has become evident that the plaice-migration from the Kattegat into the Skagerak and

[1] It appears also from the German investigations in the Baltic that the grown up plaice in spring leave the deeper water and move towards the costal grounds (S. Strodtmann: Laichen und Wandern der Ostseefische. II Bericht. Wissensch. Meeresunters. N. F. Bd. VII. Heft 2. Abt. Helgoland 1906.

[2] This question was originally raised by C. G. Joh. Petersen who has given the "Thor" particular instructions to elucidate this matter as far as possible.

vice-versa is a most important phenomenon, and as this migration takes place mainly close to the coast off the northern side of Skagen, it plays a great economical rôle for the fishermen in Skagen. It is evidently not a quite small amount of the whole Kattegat and Skagerak stock of marketable plaice which passes the Skagen yearly either to escape or to be caught under the attempt (see also Contributions I, pag. 47).

The Tables 50 and 51 represent a view illustrating the extent of the migrations from the Kattegat to the Skagerak and vice-versa. The "southern side" of Skagen indicates here the stretch from Tranestederne to the NE. buoy of Skagen's Reef. The "northern side" of Skagen indicates the stretch from Spirbakken to Skagen's light-ship. These Tables show that a very considerable number of the specimens passing the Skagen either on migration from the Kattegat into the Skagerak or reversely are recovered at Skagen[1]. It is even probable, that the number of marketable plaice which are recovered at the southern or at the northern side of Skagen by far exceeds the number that unhindered is allowed to pass this stretch.

Whether the majority of the plaice which are recovered at the south-side of Skagen and which originate from the marking experiments in the Kattegat would have migrated out into the Skagerak if they had been allowed to pass unprevented cannot be said with certainty. And it is just as unsettled if the majority of the plaice which are recovered at the northern side of Skagen and which originate from the marking experiments in the Skagerak would have migrated out into the Kattegat if they had not been caught by the fishermen. If we regard only the percentage of the plaice which succeeded in migrating from the Kattegat to the Skagerak or vice-versa, it will be found that 6·6 % of the plaice from the experiment in the Kattegat have been recovered in the Skagerak while 9·5 % of the specimens from the experiments in the Skagerak were recovered in the Kattegat.

As there is reason to suppose — according to the number and rate of growth of the young plaice in the two waters — that at least as many plaice yearly grow up to a marketable size in the Skagerak as in the Kattegat[2] it would seem as if more marketable plaice migrate from the Skagerak into the Kattegat than vice-versa.

The view that the immigration of plaice from the Skagerak to the Kattegat is greater than the emigration from the Kattegat to the Skagerak — when both young specimens and marketable fish are taken intó consideration — is also supported by the fact that at least as many plaice of the northern form yearly are fished in the Kattegat as in the Skagerak though the number of 0-group specimens of the northern form that yearly grow up in the Kattegat, is slight in proportion to the number of the 0-group specimens that grow up in the Skagerak[2].

Among the plaice which migrate from the Kattegat to the Skagerak or the North Sea, comparatively many specimens are of a considerable size. Of 537 recovered plaice of original length 20—29 cm., 29 specimens or 5·4 % were recovered in the Skagerak or in the North Sea. Of 286 plaice of original length 30—39 cm., 29 specimens or 10·1 % were recovered in the Skagerak or in the North Sea. If we regard the position of the places of liberation it will even be seen that most specimens of a length from 20—29 cm. are liberated in the northern Kattegat and most specimens from 30—39 cm. in the middle and southern Kattegat. Thus it is evident that the larger specimens show a more marked tendency to migrate out from the Kattegat to the Skagerak than the smaller ones.

[1] A proportionally considerable number of plaice in the Swedish marking experiments in the Kattegat have also been recovered near Skagen (F. Trybom: Märkning af rödspättor vid Sveriges vestkust. 1902 och 1903. Svenska Hydrografisk-biologiska Kommissionens Skrifter. Häftet II. Göteborg 1904. — Svenska rödspättemärkningar och mätningar. 1904 och 1905, ibd. Häftet III. Göteborg 1906.

[2] A. C. Johansen: Ueber die Schollenfischerei im Kattegat und die Mittel sie zu heben. Rapports et Procès-Verbaux. Conseil perm. internat. Vol. 5. 1906. p. 80—112. Taf. VI.

Table 50. Table elucidating the migration of plaice from the Skagerak to the Kattegat etc. Marking experiments in the Skagerak. 1903, 1904, 1905.

Place of Liberation	Date	No. of experiment	Total No. caught, Place of recovery known	Caught on northern side of Skagen	Caught on southern side of Skagen	Caugth in the Kattegat (excl. south. side of Skagen)	Caught in the Skagerak, E. of Skagens L. V.	Caught in the North Sea	Caught in the Lim Fjord
NW of Hirshals. 57°41′ N 9°38′ E	1903 April 17	6 1903	2	1	..	..	..	..	..
W by N of Kettrup. 57°19′ N	» » 17	7 »	7	..	..	1	..	..	..
9°28′-9°33′ E	» » 17	8 »							
NE of Bulbjerg. 57°20′ N 9°10′ E	» » 17	9 »	12	..	..	..	..	6	..
NE of Bulbjerg. 57°17′ N 9°11′ E	» » 18	10 »	6	..	..	..	..	..	..
N of Skagen. 57°46′ N 10°36′ E	» » 21	11 »	1	1	..	..	..	..	..
Off Tversted. 57°38′ N 10°12′ E	» » 21-22	12 »	7	..	..	..	..	..	..
N of Tversted. 57°36′ N 10°12′ E	» » 22	13 »	5	..	..	..	..	1	..
Jammer Bay. 57°12′-57°21′ N 8°45′-9°17′ E	1904 March 1	Tr.10 1904	45	2	4	1	1	11	3
2 miles W of Spirbakken. 57°42′ N 10°23′ E	1905 March 20	3 1905	56	15	5	7	..	..	..
Off Bulbjerg—Svinkleven	» » 22	4 »	270	13	10	11	3	33	1
Total		Number	411	32	19	20	4	51	4
		Percentage	100 %	7·8 %	4·6 %	4·9 %	1·0 %	12·4 %	1·0 %

Table 51. Table elucidating the migration of plaice from the Kattegat to the Skagerak and further westward. Marking experiments in the Kattegat in 1904 and 1905.

Place of Liberation	Date	No. of experiment	Total No. caught, Place of recovery known	Caught on southern side of Skagen	Caught on northern side of Skagen	Caught in the Skagerak, E of Skagens L. V.	Caught in the Skagerak, W of Spirbakken	Caught in the North Sea
Læsø Rende	1904 March 5	3 1904	25	2	1	..	..	..
8½ mil. NE of Hirsholmene	» » 7	4 »	15	1	2	..	..	.
Off Aalbæk	» » 14	5 »	36	12	1	..	..	..
Trindelen	» » 21	Tr.11 »	35	1	1	..	1	.
WNW of Vinga	» October 5	6 »	42	6	2	1	..	..
Off Trindelen	» » 11	7 »	8	..	..	1	..	..
Off Trindelen	» » 12	8 »	24	..	3	1	1	..
2 miles E of Aalbæk	» » 17	9 »	24	4	1	..	1	..
Pakhus Bay, Anholt	» » 25	10 »	4	..	1	..	1	..
8 miles S of Anholt Knob	» » 27	11 »	7	..	..	..	.	.
9 miles SE of Kobbergrund	» » 28	12 »	2	..	..	..	.	..
6 miles NW of Anholt Knob	» » 28	13 »	6	..	1	..	..	..
10 miles NW by W of Kullen	» » 29	14 »	60	2	5	..	3	3
10 miles NW by W of Kullen	» » 29	14A »	17	..	..	..	..	..
5 miles N of Anholt Light	1905 March 15	1 1905	62	..	3	1	1	1
SW of Anholt	» » 16-17	2 »	216	1	2	..	1	1
5 mil. N½ W of Hirsholmene	» » 29	6 »	170	66	5	..	6	..
Aalborg Bay	» April 1	7 »	50	..	6	..	..	
Total		Number	803	95	34	4	15	5
		Percentage	100 %	11·8 %	4·2 %	0,5 %	1·9 %	0·6 %

If we regard the size of the specimens which migrate from the Skagerak to the Kattegat we notice the reversed tendency. The smaller specimens show here a stronger inclination to migrate into the Kattegat than the larger ones. Of 47 recovered specimens of original length 16—24 cm. 8 or 17 % were

recovered in the Kattegat. Of 304 recovered specimens of original length 25—29 cm. 27 specimens or 8·9 % were recovered in the Kattegat and of 70 specimens of original length 30—37 cm. 4 specimens or 5·7 % were recovered in the Kattegat.

These migrations from the Kattegat to the Skagerak which we notice in the larger plaice of ca. 30—39 cm. length, and reversely in the smaller plaice of ca. 15—29 cm. seem — at any rate to a certain degree — to appear as spawning migrations and food migrations. Specimens of a length of ca. 30—39 cm. of the northern form generally approach maturity for the first time and migrate now out on relatively deep and salt water in the North Sea and Skagerak during the sensible spawning period. Many of these specimens are probably developed and have grown up in these waters.

The specimens of 15—29 cm. are on the other hand generally immature fish and in searching for grounds with rich food many of them come into the Kattegat.

The tendency of emigration from the Kattegat to the Skagerak may be traced both in winter and spring. In the autumn experiments comparatively many more marked fish were recovered in the Skagerak and the North Sea than in the spring experiments.

The immigration from the Skagerak into the Kattegat takes place to a great extent in spring (see Fig. 4 p. 19 and Pl. V and VI). If it goes on also to any considerable extent during other seasons is not settled by the experiments, but it does probably.

In the Tables below a view is represented over all the recovered marked plaice from the experiments in the Kattegat and the Skagerak in 1903—1905 together with a statement showing which specimens have been recovered in the Skagerak or the North Sea from the Kattegat experiments, and which specimens have been recovered in the Kattegat from the Skagerak experiments.

Table 52.

Original length of all recaptured plaice in the marking experiments in the Skagerak in 1903—1905, and length of specimens captured in the Kattegat.

Original length	Total number of recaptured plaice	Number of specimens recaptured in the Kattegat
16 cm.	2	..
17 »	1	..
18 »	2	1
19 »	..	..
20 »	4	..
21 »	8	1
22 »	6	1
23 »	9	1
24 »	15	4
25 »	37	7
26 »	49	1
27 »	71	6
28 »	73	8
29 »	74	5
30 »	47	4
31 »	12	..
32 »	3	..
33 »	4	..
34 »	1	..
35 »	1	..
36 »	1	..
37 »	1	..
	421	39

Table 53.

Original length of all recaptured plaice in the marking experiments in the Kattegat in 1904—1905, and length of specimens captured in the Skagerak and the North Sea.

Original length	Total number of recaptured plaice	Number of specimens recaptured in the Skagerak and the North Sea
20 cm.	1	..
21 »	5	..
22 »	50	4
23 »	48	5
24 »	71	1
25 »	61	3
26 »	79	4
27 »	64	2
28 »	72	4
29 »	86	6
30 »	80	3
31 »	52	3
32 »	54	11
33 »	39	6
34 »	21	3
35 »	17	1
36 »	16	1
37 »	4	1
38 »	1	..
39 »	2	..
	823	58

4. Do the plaice wander in shoals?

If we regard some one or other chart illustrating a marking experiment, it will as a rule be noticed that the plaice liberated on a certain spot have spread a short time afterwards over considerable areas and have migrated in far different directions. From this fact we are not, however, entitled to conclude that the plaice wander about separately and do not gather in shoals. The results of the Danish marking experiments in 1903—1906 tend to confirm the experience which many fishermen believe to have made, that the plaice show an inclination to gather in shoals. It has namely appeared, that two or three plaice from the same experiment have been recovered at the same time and on the same spot far from the place of liberation and that plaice liberated in different experiments on different localities later on have been recovered on the same spot and at the same time. A series of examples elucidating these matters will be given here.

a. Marked plaice from one experiment recovered at the same time and on the same spot at considerable distance from the place of liberation.

Experiment No. 3, 1903. On April 10th of 1903, 445 marked plaice were liberated 4 miles SE. of Vyl light-ship, 55°21′N. 7°52′E., at 10—11 fms.

1) On April 27th of 1903 two different cutters captured 2 of these plaice 4 miles W. of Graadeep, 55°25′N. 8°8′E., at 8 fms. The distance between the place of recovery and the place of liberation was ca. 10 miles.

2) On April 28th, 2 plaice were again caught by two different cutters 8 miles W. of Graadeep, 55°24′N. 8°1′E., at 8 fms. The distance between the place of recovery and the place of liberation was here ca. 6 miles.

3) On April 28th another couple of these plaice were recaptured by the cutter "Mathilde" 5 miles SW. by W. of Graadeep, 55°22′N. 8°9′E., at 8 fms. Distance ca. 10 miles.

4) On April 28th, 2 of these plaice were also recovered by the cutter "Birgitte" 6 miles W. by S. of Graadeep at 8½ fms. Distance 7 miles.

5) On April 29th, 2 specimens were again recovered by the cutter "Margrethe" 6 miles W. of Graadeep at 7½ fms. Distance 8 miles.

6) On May 1st, 2 specimens were recovered by the cutter "Kirstine" 3 miles SW. of Cancer at 7 fms. Distance 7 miles.

7) On May 1st, 2 specimens were recaptured by the cutter "Emanuel" 6 miles NW. of Graadeep at 8 fms. Distance 11 miles.

8) On May 2nd, 2 specimens were recovered by the cutter "Augusta" 2 miles W. by S. of Cancer in 8 fms. Distance 9 miles.

9) On May 23rd, 3 specimens were recovered by two different cutters 3 miles NW. of Slugen at 11 fms. Distance ca. 14 miles.

10) On August 16th, of 1903 1 specimen was recovered 20 miles NW. of Horns Reef L. V. On August 17th, 1 specimen was recovered in the same place. Distance 43 miles.

Experiment No. 5, 1903. On April 11th of 1903, 286 marked plaice were liberated N. of Horns Reef at 55°35′N. 7°40′E., 6—7 fms.

1) On April 25th and 26th of 1903, 2 of these plaice were recaptured by the cutter "Mary" 4 miles SE. of Vyl buoy. Distance between place of liberation and place of recovery 14 miles.

2) On April 30th, 2 specimens were recovered by the cutter "Thora" 7 miles W. of Graadeep in 8 fms. Distance 17 miles.

3) On May 7th, 3 of the marked fish were recovered by the cutter "Føniks" 4 miles N. of Slugen at 9 fms. Distance ca. 6 miles.

4) On May 26th, 2 of the plaice were recovered by the cutter "Aage" 2 miles NW. of Kærgaarde Bn. Distance ca. 17 miles.

Experiment No. 9, 1903. On April 17th of 1903, 13 marked plaice were liberated 11 miles NE. of Bulbjerg at 57°20′N. 9°10′E.

On April 26th of 1903, 1 specimen was recovered off Thyborøn, and on May 1st another specimen was caught at the same locality. Distance ca. 52 miles.

These examples which all originate from the experiments in 1903 might be supplemented by many others from the experiments in 1903—1905, as may be seen in the detailed tables over liberation and recovery of marked plaice.

If the specimens recovered at the same spot and at the same time far away from the place of liberation have moved together cannot be ascertained in each separate case; but as the phenomenon is very common it has in all probability often been the case.

If we regard the charts illustrating the marking experiments, the impression is often immediately conveyed that the plaice wander in shoals. On the charts Pl. XI and XII (Contributions I) it appears as if large shoals of plaice have moved towards the coast in the Horns Reef area in April and May 1903. On Pl. VI, Experiment No. 4 it will be seen, that several plaice have been recovered near Skagen ca. 60 miles from the place of liberation and ca. 1 month after liberation. If we submit the data to a closer examination it appears that 3 of the specimens were here recovered on the same day, on April 10th of 1905, and three again on April 29th (see Table 20 p. 42—43).

b. Marked Plaice liberated in different localities but recovered at the same place at the same time.

The plaice mentioned below were liberated in the following experiments in the Horns Reef Area:
Experiment No. 2. April 10., 1903. 255 Plaice liberated at 55°22′N. 7°55′E., at 9 fms.
Experiment No. 3. April 10., 1903. 445 Plaice liberated at 55°21′N. 7°52′E., at 10—11 fms.
Experiment No. 5. April 11., 1903. 286 Plaice liberated at 55°35′N. 7°40′E., at 6—7 fms.

1) On April 28., 1903, the cutter "Harboøre" caught two marked plaice, No. 428 and No. 769, 8 miles W of Graadeep at 8 fms. No. 428 came from the above mentioned experiment No. 3. No. 769 originated from the experiment No. 5. The distance of removal was respectively 6 and 17 miles.

2) On the same day, April 28., the cutter "Hvidtfeldt" caught two marked plaice 4 miles SW. by W. of Graadeep at 7 fms. One of the specimens, No. 601, originated from the above mentioned experiment No. 3 and had moved 10 miles. The other specimen came from experiment No. 5 and had moved 21 miles.

3) On April 30., 1903, the cutter "Thora" captured three marked plaice 7 miles W. of Graadeep in 8 fms. One of the specimens, No. 76, came from the above mentioned experiment No. 2 and had moved 5 miles. The two other specimens, No. 843 and No. 910, came from the experiment No. 5 and had moved 18 miles.

4) On May 2., 1903, the cutter "Karen og Ejnar" captured 2 marked plaice, No. 560 and No. 830, 1 mile SW. by W. of Cancer. No. 560 came from the experiment No. 3, No. 830 from experiment No. 5, the distance being respectively 9 and 13 miles.

5) On May 7., 1903, the cutter "Julie" captured 2 marked plaice 1 mile W. of Kærgaarde Bn. at 4½ fms. One of them, No. 43, came from experiment No. 2 and had moved 21 miles. The other, No. 697, came from experiment No. 3 and had moved 23 miles.

6) On June 16., 1903, a cutter captured two marked plaice, No. 181 and No. 791, 12 miles NE. of Horns Reef L. V. at 11 fms. They came from the experiments No. 2 and 5 (April 1903) and had moved respectively c. 23 and 8 miles from the places of liberation.

7) On August 17th of 1903, 2 marked plaice, No. 584 and No. 754, were captured 20 miles NW. of Horns Reef L. V. (It is not known if they were caught by the same cutter). They came from the experiments 3 and 5, the distance being respectively 43 and 31 miles.

These examples which solely originate from the experiments in 1903 might be supplemented by many others from the experiments in 1903, 1904 and 1905.

5. How quickly are the plaice able to move?

In the Table below a view is represented over the greatest rapidity noticed for the plaice in the Danish marking experiments in 1903—1906. The average speed per day means here the distance between the place of recovery and the place of liberation divided by the number of days passed between liberation and recovery. The "average speed" hereby obtained is naturally only a minimal-statement as the plaice cannot be supposed to have moved in a straight line.

In the Table 54 no specimen has been taken into consideration which was not recovered at least 45 miles away from the place of liberation.

Table 54. The greatest speed observed for plaice in the Danish marking experiments in 1903—1906.

No. on label	Place of liberation	No. of experiment	Distance betw. place of liberation and place of recapture, miles	Time between liberation and recovery, No. of days	Average speed pr. day, miles
{Da 04 415	Horns Reef Area	Trpl. exper. No. 4 1904	77	5	15·40}
Da 1029	Skagerak	Mark. exper. No. 9 1903	52	9	5·78
Da 4 327	Southern Kattegat	Mark. exper. No. 14 1904	310	54	5·74
Da 04 302	Horns Reef Area	Trpl. exper. No. 3 1904	104	22	c. 4·7
Da 1025	Skagerak	Mark. exper. No. 9 1903	52	14	3·71
Da 05 1007	Skagerak	Mark. exper. No. 4 1905	62	20	3·10
Da 05 667	Skagerak	Mark. exper. No. 4 1905	57	19	3·0
Da 05 712	Skagerak	Mark. exper. No. 4 1905	57	19	3·0
Da 05 867	Skagerak	Mark. exper. No. 4 1905	57	19	3·0
Da 1211	North Sea off Hanstholm	Mark. exper. No. 17 1903	52	18	2·89
Da 05 1071	Skagerak	Mark. exper. No 4 1905	57	20	2·85
Da 05 944	Skagerak	Mark. exper. No. 4 1905	128	45	2·84
Da 05 877	Skagerak	Mark. exper. No. 4 1905	169	63	2·68
Da 05 635	Skagerak	Mark. exper. No. 4 1905	117	46	2·54
Da 05 1125	Skagerak	Mark. exper. No. 4 1905	131	52	2·52
Da 4 365	Southern Kattegat	Mark exper. No. 14 1904	335	141	2·38
Da 05 267	Middle Kattegat	Mark. exper. No. 2 1905	74	33	2·24
Da 05 1096	Skagerak	Mark. exper. No. 4 1905	91	41	2·22
Da 05 1102	Skagerak	Mark. exper. No. 4 1905	129	63	2·05
Da 1024	Skagerak	Mark. exper. No. 9 1903	108	53	2·04
Da 04 412	Horns Reef Area	Trpl. exper. No. 4 1904	46	23	2·0
Da 04 1720	Skagerak	Trpl. exper. No. 10 1904	118	59	2·0
Da 05 989	Skagerak	Mark. exper. No. 4 1905	c. 70	35	c. 2·0
Da 05 1161	Skagerak	Mark. exper. No. 4 1905	c. 70	35	c. 2·0

For comparison with the speed given in Table 54 it may be stated that the greatest speed for plaice which Bolau and Trybom noticed in the German and Swedish marking experiments in 1903 and 1904 was as follows:

1	specimen	5	miles	per	day	in	14	days (Bolau).
1	»	5	»	»	»	»	14	» (Bolau).
1	»	3·72	»	»	»	»	43	» (Bolau).
1	»	3·05	»	»	»	»	23	» (Bolau).
1	»	2·86	»	»	»	»	28	» (Trybom).
1	»	2·76	»	»	»	»	29	» (Bolau).
1	»	2·67	»	»	»	»	30	» (Bolau).

As showed in Table 54 a far greater speed was observed for one single specimen than for any of the others, namely 15·40 miles per day. As a fact it does not seem incredible that a plaice should be able to move with such a considerable speed[1]; but as this result stands quite isolated, and as mistakes may easily occur in the statement about place of recovery it will for the present time be safest to distrust this statement.

The next greatest speed we notice is 5·78 miles per day and the third greatest 5·74 per day, as one plaice seems to have covered a distance of ca. 52 miles in 9 days and another a distance of 310 miles in 54 days. A speed of ca. 5 miles per day is recorded by Bolau for two specimens in the German marking experiments in 1904. As we thus possess several results pointing in the same direction and as this "average speed" is not conspicuously great in comparison with other statements we may regard it as probable, that plaice are able to move at least with a speed of 5—6 miles per day.

A speed from 2—4 miles per day has been noticed for several plaice, but it is evidently quite exceptionally that they move with so great a speed in the same direction and for a fairly long time.

It will be seen in Table 54 that the majority of the specimens for which a speed of over 2 miles per day has been noticed originate from the experiments in the Skagerak. We find in this an expression of the fact, that the plaice in the Skagerak move much faster than the plaice in the Kattegat and in the Horns Reef area. The specimens originating from the Horns Reef area which have moved with a speed of more than 2 miles per day all come from the transplantation experiments which suggest that the transplanted specimens move far quicker from one place to another than the not transplanted ones (compare p. 20). It should here be remembered that several times as many specimens were recaptured in the ordinary marking experiments as in the transplantation experiments in the Horns Reef area.

6. Causes of observed migrations of plaice.

The causes of the migrations of the plaice are of various kinds. The migration is probably among others influenced by the following factors.

1. The distribution of the food.

When the plaice show a general tendency to migrate away from the coast as they grow up, and hereby enlarge their area of distribution, it is surely among others the distribution of the food which here plays a rôle[2]. A large stock of grown up fish would not be able to live in the narrow shore belt where the young bottom stages of the youngest series are distributed.

The migrations of the grown up plaice are undoubtedly also often influenced by the distribution of the food, but it is very difficult to decide when the migrations should be regarded as food migrations and when other factors than the food essentially influence the specimens' change of residence[3].

[1] Fulton has observed that grown up plaice gently swimming in the spawning pond at the Fishery Board's Laboratory at Aberdeen may move 100—140 feet per minute, or considerably over a mile an hour. (Scottish Fishery Board Rep. 21, 1903, p. 42).

[2] H. C. Redeke: "The distribution of the plaice on the Dutch coast". Rapports et Procès-Verbaux, Vol. III, Conseil perm. intern. pour l'explorat. de la mer. 1905.

[3] C. G. Joh. Petersen is of opinion that the plaice seek the shallow water in spring in the search for food. — Garstang supposes that the off-shore migration of plaice in summer is in relation with their search for food (North Sea Fisheries

2. The temperature.

As it appears that the plaice in the warmest as well as in the coldest season show an inclination to migrate away from the quite shallow water towards the deeper and more temperate water we have reason to suppose that this migration, at least partly, is dependent on the temperature, which also is a general opinion[1].

The fact, that the plaice during the spawning period show a disinclination to stay in quite shallow water[2] is possibly in accordance with the circumstance that they are at times in such waters exposed to such low temperatures which may be injurious to them.

3. The salinity.

What rôle the salinity plays for the active migrations of the plaice is but little elucidated. Generally the plaice avoid the water of less salinity than c. 5‰ and they do not seem to be able to pass all stages of their development in such water. But otherwise the plaice is very euryhaline.

The dwarf and brackish water form which is distributed in the Belt Sea and the southern Kattegat may sometimes occur in water of a salinity exceeding 34·5‰.

4. The currents.

The distribution of the pelagic stages of the plaice is naturally in the highest degree dependent on the currents. The young bottom stages are also in all probability drifting with the current to no slight extent.

If the older stages of plaice show a general tendency to drift with the current or to move against it is not yet known.

At the east-coast of Scotland FULTON has noticed that the movement of the plaice is on the whole in a direction opposite to the prevailing current[3], and GARSTANG is of opinion, that there is much in the results of more recent experiments to support the idea that the migration of plaice have a preponderating tendency in opposition to the prevailing currents (North Sea Investigations l. c. p. 31).

5. Wind and shelter.

That the plaice during gales blowing on the shore either must leave the shallow water or squeeze themselves hard down into the bottom is *a priori* probable.

At the northern side of Skagen it appears that most plaice are captured after south-western, western or north-western gales. It is a probable explanation of this fact, that many plaice during the gale leave the shallow water in the Tannis Bay and take shelter in the deeper water off the northern side of Skagen.

At the northern side of Skagen only a few plaice are recaptured after eastern gales[4].

Investigation Committee. Report (No. 2 — Southern Area) on Fishery and Hydrographical Investigations in the North Sea etc. 1905.)

[1] See for instance: H. KRØYER: Danmarks Fiske, Bd. II, Kjøbenhavn, 1843—45, p. 272. — H. C. REDEKE: The Distribution of the Plaice on the Dutch coast. Rapports et Procès-Verbaux, vol. III. Conseil internat. pour l'exploration de la mer. 1905. — A. C. JOHANSEN: Contributions to the Biology of the Plaice, I. Medd. fra Komm. for Havunders. 1905, p. 25—27.

[2] E. L. V. HOLT in Journal Mar. Biol. Assoc. III. 1895, p. 395. — T. W. FULTON in Report Fishery Board for Scotland VII, Part III, 1889, p. 188; ibd. VIII, Part III, 1890, p. 261. Report on Fishery and Hydrographical Investigations in the North Sea etc., 1902—1903, p. 593 etc. London 1905.

[3] Report Fishery Board of Scotland. *11.* Part III, p. 186. *15.* Part III, p. 374. *21.* Part III, p. 42. Report on Fishery and Hydrographical Investigations in the North Sea, etc. 1905. p. 594.

[4] On the migrations' probable dependence on wind and lee see for instance: OLAVIUS: Schagens Beskrivelse, Kiøbenhavn 1787, p. 178—180. H. KRØYER: Danmarks Fiske, Bd. II, Kjøbenhavn 1843—45, p. 272. W LILLJEBORG: Sveriges och Norges Fiskar, Bd. II, Upsala 1891, p. 375. W. GARSTANG: Fishery and Hydrographical Investigations in the North Sea, etc., Southern Area, 1905, p. 10 and 31.

C. The intensity of fishing.

a. The intensity of fishing in different areas.

A view over the percentage of plaice recaught in the ordinary Danish marking experiments with plaice in 1903 to 1906 will be represented in the following. The four areas: the Horns Reef area, the Hanstholm—Søndervig area, the Skagerak and the Kattegat will here be treated separately.

1. The intensity of fishing in the Horns Reef area.

In the Table 55A a view is represented over the total number of liberated and recaptured specimens in the ordinary Danish marking experiments in the Horns Reef area during the years 1903—1906. It will be seen that the average recapture in the course of one year amounts to ca. 42 % of all the liberated specimens. A far greater percentage was recovered of the larger specimens than of the smaller ones. Thus it appears in Table 55B that 55·2 % of 1001 specimens of initial length 25 cm. or above were recovered within one year. In comparison with this it should be noted that 815 specimens which at liberation were of a length of below 25 cm. only gave 209 recaptures or 25·6 % in the same time.

Of the specimens which at liberation had a size of 25 cm. or above the following numbers were recovered within one year (in 1906 within 6 months).

	No. liberated	No. recovered	Percentage recovered
In the experiments in April, 1903	522	219	42·0 %
» » » » Febr., 1904	51	37	72·5 %
» » » » April, 1905	248	176	71·0 %
» » » » April, 1906	180	121	67·2 %

It is here obvious that only a relatively slight percentage was recaptured of the specimens liberated in 1903.

It should be noticed that a specimen from the experiments in 1903 was taken "dead and rotten" on the sea bottom shortly after liberation. This fact would seem to indicate that all the experiments at Horns Reef in 1903 have not been quite successful.

It is also worthy of note that in the year in which the least percentage was recovered, the Esbjerg cutters yield of the plaice-fishery was comparatively slight while the yield was far more considerable in 1904 and 1905 when the high percentages were recaptured (see p. 60—63). We might imagine the reason of the slight yield in 1903 to be, that proportionally many plaice had this year succeeded in leaving the Horns Reef area without being caught by the fishermen. As has been referred to previously there is, however, also the possibility that the slight yield of the fishery in the Horns Reef area in 1903 may be owing to the circumstance, that the plaice increased proportionally slowly in that year wherefore comparatively few young specimens obtained a marketable size.

According to Bolau[1], 264 plaice of a length of 13—55 cm. were liberated in the Horns Reef area at 23—30 meters depth on March 18th of 1904. In the course of one year 86 specimens or 32·6 % were recovered. Of 156 specimens measuring 25 cm. or above, ca. 42 % were recaptured. In other German experiments which were undertaken on July 20th, 1904, 72 specimens were liberated in the same area at 25—27 meters depth. Until the end of April, 1905 only one specimen or 1·4 % was recovered. The reason of this slight percentage may presumably be ascribed to the fact, that the experiment was carried on at a time when the intense spring fishery was over (if we dare take for granted that the specimens were quite well and strong at liberation).

The German experiments with aluminium-rings are not taken into consideration here, as this method of marking has proved to be unsatisfactory.

[1] Bolau: Die deutschen Versuche mit gezeichneten Schollen. I. Bericht. Wissensch. Meeresuntersuch. VII. B. 1905.

The experiments which have hitherto been mentioned can only give an idea of the intensity of fishing in the Horns Reef area at depths below 30 meters. At greater depths where the fish are less numerous, the fishing is also less intense.

In a marking experiment carried on by the English research steamer "Huxley" on the Horns Reef Outer Grounds at 55°25′ N. lat. 6°2′ E. long. on the 15th September, 1903, 29 specimens were set free and seven of these or 24·1 % were recaptured within one year[1].

In a Danish marking experiment on the Horns Reef Outer Grounds at 45 meters depth 5 marked plaice of 35—57 cm. length were set free on September 28th, 1904. None of these specimens have later on been recorded as recovered. (Concerning the Danish transplantation experiments in the Horns Reef area, see p. 15—17.)

Table 55 A. Number of specimens recaptured in the ordinary marking experiments with plaice in the Horns Reef Area. 1903—1906.

Date of Liberation	Station No.	Number of Experiment	Locality and Depth of Liberation	Total No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Septbr. 30., 1906	Percentage recaught until Septbr. 30., 1906
1903 April 10	36	1 1903	7 miles WSW of Nymindegab. 17 meters	12	0	0.0	2	16·7
» » 10	38	2 1903	6 miles SE by E of Vyl Light-ship. 17 m.	255	56	22·0	65	25·5
» » 10	39	3 1903	4 miles SE of Vyl Light-ship. 20 m.	445	112	25·2	121	27·2
» » 11	40	4 1903	18 miles WNW of Horns Reef Light-ship. 32-34 m.	2	1	50·0	1	50·0
» » 11	41	5 1903	2 à 3 miles N of Tuxen. 11—13 m.	286	124	43·4	132	46·2
1904 Febr. 22-23	192	1 1904	7 miles S by W ½ W from Blaavand. 14 m.	165	48	29·1	57	34·5
» » »	195	2 1904	3½ miles W ¾ S from Kærgaarde Bn. 15 m.	45	28	62·2	29	64·4
1905 April 15	381	8 1905	8 miles SSW of Blaavands Point. 14 m.	200	143	71·5	146	73·0
» » 15	382	9 1905	Northern Part of Slugen. 15 m.	145	89	61·4	90	62·1
» » 15	...	10 1905	Graadeep, inside the bar, 6 m.	40	28	70·0	29	72·5
» Septbr. 29	...	11 1905	Graadeep W of Esbjerg Harbour. 9 m.	21	7	33·3	7	33·3
1906 April 7	799	1 1906	9 miles SW by W of Blaavand. 16 m.	150	80[1]	53·3[1]	80	53·3
» » 10	805	2 1906	N of Slugen. 55°34′ N. 7°46′ E. 13 m.	50	46[1]	92·0[1]	46	92·0
				1816	762	42·0	805	44·3

[1] show recaptures until Septbr. 30., 1906.

Table 55 B. Number of specimens recaptured in the ordinary marking experiments with plaice in the Horns Reef Area. 1903—1906.

Date of Liberation	Station No.	No. of Experiment	Specimens of 25 cm. or above when set free					Specimens below 25 cm. when seet free				
			No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Sept. 30., 1906	Percentage recaught until Sept. 30., 1906	No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Sept. 30., 1906	Percentage recaught until Sept. 30., 1906
1903 April 10	36	1 1903	...	...	...	...	...	12	0	0·0	2	16·7
» » 10	38	2 1903	66	28	42·4	28	42·4	189	28	14·8	37	19·6
» » 10	39	3 1903	211	74	35·1	75	35·5	234	38	16·2	46	19·7
» » 11	40	4 1903	2	1	50·0	1	50·0	...	...	...	...	...
» » 11	41	5 1903	243	116	47·7	122	50.2	43	8	18·6	10	23·3
1904 Febr. 22-23	192	1 1904	23	16	69·6	16	69·6	142	32	22·5	41	28·9
» » »	195	2 1904	28	21	75·0	22	78·6	17	7	41·2	7	41·2
1905 April 15	381	8 1905	130	101	77·7	101	77·7	70	42	60·0	44	62 9
» » 15	382	9 1905	95	60	63·2	60	63·2	50	29	58·0	30	60·0
» » 15	...	10 1905	20	14	70·0	14	70·0	20	14	70·0	15	75·0
» Septbr. 29	...	11 1905	3	1	33·3	1	33·3	18	6	33·3	6	33·3
1906 April 7	799	1 1906	132	76[1]	57·6[1]	76	57·6	18	4[1]	22·2[1]	4	22·2
» » 10	805	2 1906	48	45[1]	93·8[1]	45	93·8	2	1[1]	50·0[1]	1	50·0
			1001	553	55·2	561	56·0	815	209	25·6	243	29·8

[1] show recaptures until Septbr. 30., 1906.

[1] Garstang: Report on Experiments with marked fish during 1902—1903. Report (No. 2. Southern Area) on Fishery and Hydrographical investigations etc. for 1902—1903. London 1905.

2. The intensity of fishing in the Hanstholm—Søndervig Area.

In the Hanstholm—Søndervig area where the Danish plaice fishery is of far less importance than in the Horns Reef area a proportionately small number of plaice have been marked, namely 99 in 1903 and 40 in 1905.

It may be seen in the Tables 56 A & B that in one year ca. 30 % of all the liberated specimens were recaptured and ca. 40 % of the specimens which at liberation were of a length of 25 cm or above. Of 53 specimens measuring below 25 cm. at liberation only 9 specimens or ca. 17 % were recovered within one year. Though the recovered percentage of marked plaice is rather considerable also in this area, it is far less than in the other areas: Horns Reef, Skagerak and Kattegat. This must evidently — at any rate essentially — be ascribed to the fact that the west-coast of Jutland is destitute of fishing harbours on the proportionally long distance between Skagen and Esbjerg.

At Tarbot Bank at 56°28′—56°34′ N. lat. 5°57′—6°17′ E. long and 30—45 meters depth, the German investigators liberated in September 1903 and March 1904 85 specimens measuring 24—51 cm. In the course of one year 10 specimens or 11·8 % were recovered (Bolau l. c.). It is also here confirmed, that the plaice-fishery is carried on with far less intensity on the off-shore grounds than on the costal grounds.

Table 56 A. Number of specimens recaptured in the ordinary marking experiments with plaice on the shore-grounds off Hanstholm—Søndervig (the North Sea). 1903 and 1905.

Date of Liberation	Station No.	Number of Experiment	Locality and Depth of Liberation	Total No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Septbr. 30., 1906	Percentage recaught until Septbr. 30., 1906
1903 April 23	62	15 1903	5 miles WSW of Bjergehuse Bn. 21—24 m.	21	5	23·8	5	23·8
» » 23	64	16 1903	1½ mile W of Torup Bn. 17—19 m.	48	14	29·2	18	37·5
» » 23	...	17 1903	3 miles W of Hanstholm. 23 m.	30	10	33·3	11	36·7
1905 March 24	354	5 1905	3 miles W of Torup Bn, 18 m.	40	14	35·0	14	35·0
				139	43	30·9	48	34·5

Table 56 B. Number of specimens recaptured in the ordinary marking experiments with plaice on the shore-grounds off Hanstholm—Søndervig (the North Sea). 1903 and 1905.

Date of Liberation	Station No.	No. of Experiment	Specimens of 25 cm. or above when set free					Specimens below 25 cm. when set free				
			No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Sept. 30., 1906.	Percentage recaught until Sept. 30., 1906	No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Sept. 30 , 1906	Percentage recaught until Sept. 30., 1906
1903 April 23	62	15 1903	10	4	40·0	4	40·0	11	1	9·1	1	9·1
» » 23	64	16 1903	31	11	35·5	15	48·4	17	3	17·6	3	17·6
» » 23	...	17 1903	15	8	53·3	9	60·0	15	2	13·3	2	13·3
1905 March 24	354	5 1905	30	11	36·7	11	36·7	10	3	30·0	3	30·0
			86	34	39·5	39	45·3	53	9	17·0	9	17·0

3. The intensity of fishing in the Skagerak.

In Table 57 A a view is represented over the number of liberated and recovered plaice in the ordinary marking experiments in 1903 and 1905. Ca. 41 % of all the liberated specimens are on an average recovered here.

Of 750 specimens which at liberation were of a length of 25 cm. or above, 45·7 % were recovered in the course of one year. Of 146 specimens measuring 15—24 cm. at liberation, only 27 specimens or 18·5 % were recovered in the same time (see Table 57 B).

Table 57 A. Number of specimens recaptured in the ordinary marking experiments with plaice in the Skagerak. 1903 and 1905.

Date of Liberation	Station No.	Number of Experiment	Locality and Depth of Liberation	Total No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Septbr. 30., 1906	Percentage recaught until Septbr. 30., 1906
1903 April 17	49	6 1903	10 miles NW ½ N of Hirshals, 49 m.	2	2	100·0	2	100·0
» » 17	51	7 1903	3 à 4 miles W by N of Kjettrup. 11—15 m.	12	6	50·0	8	66·7
» » 17	52	8 1903	6 miles W by N of Kjettrup. 13 m.	6	1	16·7	1	16·7
» » 17	53	9 1903	11 miles NE of Bulbjerg. 17—19 m	13	12	92·3	12	92·3
» » 18	54	10 1903	10 miles NE of Bulbjerg. 13—17 m.	19	5	26·3	6	31·6
» » 21	58	11 1903	1 mile N of Skagen's Light. 19 m.	2	1	50·0	1	50·0
» » 21-22	59	12 1903	Off Tversted. 15—23 m.	45	7	15·6	7	15·6
» » 22	60	13 1903	Off Tversted. 7—13 m.	14	5	35·7	5	35·7
» » 22	61	14 1903	4 miles NE of Hanstholm. 24—28 m.	8	0	0·0	0	0·0
1905 March 20	349	3 1905	2 miles W of Spirbakken Bn. 17 m.	200	56	28·0	56	28·0
» » 22	...	4 1905	Off Bulbjerg — Svinkleven. 10—16 m.	575	275	47·8	278	48·4
				896	370	41·3	376	42·0

Table 57 B. Number of specimens recaptured in the ordinary marking experiments with plaice in the Skagerak. 1903 and 1905.

Date of Liberation	Station No.	No. of Experiment	Specimens of 25 cm. or above when set free					Specimens below 25 cm. when set free				
			No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Sept. 30., 1906	Percentage recaught until Sept. 30., 1906	No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Sept. 30., 1906	Percentage recaught until Sept. 30., 1906
1903 April 17	49	6 1903	2	2	100·0	2	100·0	..	..	...	..	...
» » 17	51	7 1903	3	3	100·0	3	100·0	9	3	33·3	5	55·6
» » 17	52	8 1903	1	1	100·0	1	100·0	5	0	0·0	0	0·0
» » 17	53	9 1903	8	8	100·0	8	100·0	5	4	80·0	4	80·0
» » 18	54	10 1903	5	2	40·0	2	40·0	14	3	21·4	4	28·6
» » 21	58	11 1903	2	1	50·0	1	50·0	..	..	...	..	...
» » 21-22	59	12 1903	16	6	37·5	6	37·5	29	1	3·4	1	3·4
» » 22	60	13 1903	2	1	50·0	1	50·0	12	4	33·3	4	33·3
» » 22	61	14 1903	2	0	0·0	0	0·0	6	0	0·0	0	0·0
1905 March 20	349	3 1905	150	49	32·7	49	32·7	50	7	14·0	7	14·0
» » 22	...	4 1905	559	270	48·3	273	48·8	16	5	31·3	5	31·3
			750	343	45·7	346	46·1	146	27	18·5	30	20·5

4. The intensity of fishing in the Kattegat.

The greater part of the Kattegat belongs to the waters where the plaice-fishery is carried on with the greatest intensity. As shown in the Table 58 A, 60·6 % of 1250 marked plaice have been recovered within one year after liberation. Of 997 specimens of initial length 25 cm. or above, 619 or 62·1 % were recovered within twelve months. Of 253 specimens measuring 20—24 cm., 138 specimens or 54·5 % were recovered in the same time.

Table 58 A. Number of specimens recaptured in the ordinary marking experiments with plaice in the Kattegat. 1904 and 1905.

Date of Liberation	Station No.	Number of Experiment	Locality and Depth of Liberation	Total No. of specimens liberated	No. recaught within one year	Percentage recaugth within one year	No. recaught until Septbr. 30., 1906	Percentage recaught until Septbr. 30., 1906
1904 March 5	206	3 1904	Læsø Rende. 16 m.	30	24	80·0	25	83·3
» » 7	207	4 1904	NE of Hirsholmene. 29 m.	20	15	75·0	15	75·0
» » 14	215-216	5 1904	Aalbæk Bay. 12 m.	40	37	92·5	37	92·5
October 5	266	6 1904	11 miles WNW from Vinga. 44 m.	72	43	59·7	44	61·1
» 11	278	7 1904	2½ miles SSW from Trindelen. 34 m.	19	8	42·1	8	42·1
» » 12	280	8 1904	8 miles NW by N from Trindelen. 42 m.	43	24	55·8	24	55·8
» » 17	288	9 1904	Aalbæk Bay. 7 m.	26	24	92·3	24	92·3
25	303	10 1904	Pakhus Bay. S of Anholt. 24—30 m.	10	4	40·0	4	40·0
» 27	305	11 1904	8 miles S of Anholt Knob. 32 m.	25	6	24·0	7	28·0
28	307	12 1904	SE by S of Kobbergrund. 24—40 m.	6	2	33·3	2	33·3
28	308	13 1904	6 miles NW from Anholt Knob. 30 m.	20	6	30·0	7	35·0
» 29	309	14 1904	10 miles NW by W from Kullen. 32 m.	139	67	48·2	81	58·3
1905 March 15	341	1 1905	5 miles N of Anholt Light. 19 m.	95	70	73·7	70	73·7
» 16-17	344-347	2 1905	SW of Anholt Harbour. 15—17 m.	305	210	68·9	219	71·8
» 29	359	6 1905	Aalbæk Bay. 16 m.	300	170	56·7	171	57·0
April 1	361	7 1905	Aalborg Bay. 15 miles SE of Hals L. V. 9 m.	100	47	47·0	50	50·0
				1250	757	60·6	788	63·0

Table 58 B. Number of specimens recaptured in the ordinary marking experiments with plaice in the Kattegat. 1904 and 1905.

Date of Liberation	Station No.	No of Experiment	Specimens of 25 cm. or above when set free					Specimens below 25 cm. when set free				
			No. of specimens liberated	No. recaught within one year	Percentage recaught within one year	No. recaught until Sept. 30., 1906	Percentage recaught until Sept. 30., 1906	No. of specimens liberated	No. recaught whitin one year	Percentage recaught within one year	No. recaught until Sept. 30., 1906	Percentage recaught until Sept. 30., 1906
1904 March 5	206	3 1904	12	8	66·7	9	75·0	18	16	88·9	16	88·9
» 7	207	4 1904	13	10	76·9	10	76·9	7	5	71·4	5	71·4
» 14	215-216	5 1904	30	28	93·3	28	93·3	10	9	90·0	9	90·0
October 5	266	6 1904	58	40	69·0	40	69·0	14	3	21·4	4	28·6
11	278	7 1904	15	8	53·3	8	53·3	4	0	0·0	0	0·0
12	280	8 1904	38	21	55·3	21	55·3	5	3	60·0	3	60·0
17	288	9 1904	4	4	100·0	4	100·0	22	20	90·9	20	90·9
» 25	303	10 1904	10	4	40·0	4	40·0	...	...	...	...	...
» 27	305	11 1904	25	6	24·0	7	28·0	...	...	...	...	...
28	307	12 1904	6	2	33·3	2	33·3	...	...	...	...	...
» 28	308	13 1904	20	6	30·0	7	35·0	...	...	...	...	...
29	309	14 1904	139	67	48·2	81	58·3		...	...	...	...
1905 March 15	341	1 1905	95	70	73·7	70	73·7	...	...	...	...	...
» » 16-17	344-347	2 1905	300	208	69·3	216	72·0	5	2	40·0	3	60·0
» 29	359	6 1905	179	109	60·9	109	60·9	121	61	50·4	62	51·2
» April 1	361	7 1905	53	28	52·8	30	56·6	47	19	40·4	20	42·6
			997	619	62·1	646	64·8	253	138	54·5	142	56·1

β. On marked "undersized" fish and the percentage of these which were again recovered as "undersized" fish, i. e. at a size below 25 cm.

It has appeared in the marking experiments that a considerable percentage of the liberated undersized fish were captured again as undersized fish. This fact is of great importance, as it shows that the very stock of undersized fish is highly influenced by the fishing.

Table 59. Number of "undersized" plaice (i. e. below 25 cm.) recaptured in the ordinary Danish marking experiments with plaice in the North Sea and the Skagerak in 1903—1906.

No. of Experiment	Month of Liberation	Place of Liberation	Size of "undersized" plaice at Liberation cm.	No. of "undersized" plaice liberated	No. of plaice recaptured as "undersized" within one year	Percentage recaptured within one year
1, 2, 3, 5 1903	April, 1903	Horns Reef area. 11—20 m.	12—24	478	58	12·1
1—2 1904	Febr., 1904	Horns Reef area. 14—15 m.	19—24	159	30	18·9
8—9 1905	April, 1905	Horns Reef area. 14—15 m.	21—24	140	45	32·1
11 1905	Septbr., 1905	Graadeep inshore waters. 6 m.	20—24	18	6	33·3
1—2 1906	April, 1906	Horns Reef area. 13—16 m.	24	20	3	15·0
15—17 1903	April, 1903	Hanstholm—Søndervig area. 17—24 m.	13—24	43	5	11·6
5 1905	March, 1905	Hanstholm—Søndervig area. 18 m.	23—24	10	1	10·0
7—14 1903	April, 1903	Skagerak. 8—28 m.	15—24	80	11	13·8
3—4 1905	March, 1905	Skagerak. 10—19 m.	19—24	66	5	7·6
			12—24	1014	164	16·2

Table 60. Number of "undersized" plaice (i. e. below 25 cm.) recaptured in the ordinary Danish marking experiments with plaice in the Kattegat in 1904 and 1905.

No. of Experiment	Month of Liberation	Place of Liberation	Size of "undersized" plaice at Liberation cm.	No. of "undersized" plaice liberated	No. of plaice recaptured as "undersized" within one year	Percentage recaptured within one year
3 1904	March, 1904	Læsø Rende. 16 m.	21—24	18	4	22·2
4 1904	March, 1904	NE of Hirsholmene. 29 m.	21—24	7	4	57·1
5 1904	March, 1904	Aalbæk Bay. 12 m.	22—24	10	5	50·0
6 1904	Octbr., 1904	11 miles WNW from Vinga. 44 m.	21—24	14	3	21·4
7—8 1904	Octbr., 1904	At Trindelen. 34—42 m.	20—24	9	2	22·2
9 1904	Octbr., 1904	Aalbæk Bay. 7 m.	20—24	22	8	36·4
2 1905	March, 1905	SW of Anholt Harbour. 15—27 m.	21—24	5	0	0·0
6 1905	March, 1905	Aalbæk Bay. 16 m.	22—24	121	46	38·0
7 1905	April, 1905	Aalborg Bay, SE of Hals. 9 m.	21—24	47	18	38·3
			20—24	253	90	35·6

It will be seen from the Table 59 that of 1014 undersized fish liberated on the grounds off Jutland's west-coast in the North Sea and in the Skagerak, 164 specimens or 16·2 % were recovered in the course of one year, before they had reached a size of 25 cm. In the same time 81 specimens or 8 % were recovered at a size of 25 cm. or above. In the experiments in the Horns Reef area in 1905 even more than 30 % were recaptured as undersized fish of a length of 20—24 cm.

In the Kattegat experiments the percentage of recovered undersized fish has been far greater than in the North Sea and the Skagerak. Of 253 liberated undersized fish, 90 specimens or 35·6 % were recovered as undersized fish in the course of one year. During the same period 48 specimens or 19 % were recovered at a size of 25 cm. or more.

The here stated percentages point in the direction that the stock of undersized fish of ca. 16—24 cm.[1] is highly influenced by the fishing in the Kattegat and in the coast-belt off the west-coast of Jutland. The influence is even far greater here than we get an impression of by looking over the recorded percentages,

[1] Only very few specimens have been marked at a size below 16 cm.

as the small specimens lose their labels proportionately easily and on the whole suffer more by the marking than the larger specimens.

On the rearing grounds for plaice in the Kattegat and the Skagerak the fishing by otter-trawl and other gears injurious to the young plaice is only carried on to a slight extent. In the North Sea a considerable trawl-fishery is taking place on the rich rearing grounds in the Horns Reef area and off the German and Dutch coasts. The trawlers destroy here multitudes of young plaice which would have invaded the scarcely populated off-shore grounds later on if not wasted.

D. The proportions of the marked fish caught by the various participating fishing vessels.

Of the plaice which were liberated in the Danish marking and transplantation experiments in the Horns Reef area in 1903, 1904 and 1905, ca. 762 specimens were recovered in the North Sea until September 30, 1906. The Danish cutters or smaller vessels caught 594 specimens or 79·0 %, while 158 specimens or 21·0 % were recovered by foreign trawlers. Of the 158 specimens 123 were caught by English trawlers, 30 by German trawlers, 3 by Belgian trawlers and 2 by Dutch trawlers. The captures by the vessels from the various countries in the years 1903, 1904 and 1905 are represented in the Table below.

Table 61. Number of marked plaice caught in the North Sea by the various participating fishing vessels. Marking and transplantation experiments in the Horns Reef Area. 1903, 1904, 1905.

	Captured by Danish fishermen	Captured by English fishermen	Captured by German fishermen	Captured by Belgian fishermen	Captured by Dutch fishermen	Total
Mark. exper. 1903.....	244	60	15	1	0	320
Mark. and Trpl. exper. 1904	130	27	9	0	1	167
Mark. exper. 1905.....	220	36	6	2	1	265
Number.....	594	123	30	3	2	752
Percentage...	79·0 %	16·4 %	4·0 %	0·4 %	0·3 %	100 %

In Table 62 a view is represented over the proportion of the marked plaice caught by the various participating fishing nations on different depths in the North Sea off the west-coast of Jutland. It will be seen from this summary, that the majority of the marked plaice have been recovered by Danish fishermen at depths below 30 meters, while most fish outside this line were recovered by foreign trawlers.

At depths between 1—10 meters 97·6 % of the recovered fish were taken by Danish vessels and only 2·4 % by foreign trawlers. At depths between 11 and 20 meters the percentage of the Danish recaptures amounts to 91·2 while the percentage of foreign recaptures amounts to 8·8 %. At depths between 21 and 25 meters the percentage of Danish and foreign recaptures is respectively 69·0 and 31·0. At depths between 26 and 29 meters the number of foreign recaptures approach the number of Danish recaptures. The percentage is here 58·6 for Danish vessels and 41·4 for foreign vessels. At depths exceeding 30 meters the foreign vessels catch constantly more of the marked fish than the Danish do. The percentage for the Danish vessels has here fallen down to 19·6 while for the foreign vessels it has risen to 80·4.

It will be seen in Table 62 that the great majority of the recovered specimens were fished at depths between 11 and 20 meters. Of the recovered 707 specimens for which the depth at the place of recovery is known, 5·9 % were recovered at depths between 1—10 meters, 64·2 % at depths between 11—20 meters, 17·8 % between 21 and 25 meters, 4·1 % between 26—29 meters, and 7·9 % at depths above 30 meters.

Table 62. The proportion of marked plaice caught by the various participating fishing vessels at various depths in the North Sea. Marking and transplantation experiments in the Horns Reef Area 1903, 1904, 1905.

Nation	Year	1—10 meters	11—20 meters	21—25 meters	26—29 meters	30 meters and above	Total. Depth at Place of recovery known
Denmark	1903	17	159	42	2	6	226
»	1904	16	85	20	8	0	129
»	1905	8	170	25	7	5	215
»	1903—1905	**41**	**414**	**87**	**17**	**11**	**570**
England	1903	0	18	20	3	15	56
»	1904	0	4	8	2	11	25
»	1905	0	12	8	3	5	28
»	1903—1905	**0**	**34**	**36**	**8**	**31**	**109**
Germany	1903	0	3	0	1	6	10
»	1904	1	1	1	2	2	7
»	1905	0	0	1	0	5	6
»	1903—1905	**1**	**4**	**2**	**3**	**13**	**23**
Belgium	1903	0	0	0	0	1	1
»	1904	0	0	0	0	0	0
»	1905	0	1	1	0	0	2
»	1903—1905	**0**	**1**	**1**	**0**	**1**	**3**
Netherlands	1903	0	0	0	0	0	0
»	1904	0	0	0	1	0	1
»	1905	0	1	0	0	0	1
»	1903—1905	**0**	**1**	**0**	**1**	**0**	**2**
Total	**1903—1905**	**42**	**454**	**126**	**29**	**56**	**707**

Of the recaptured plaice which were liberated in the Horns Reef area at depths between 7 and 20 meters in April, 1903, February, 1904, and April, 1905, the great majority were during the first months after liberation caught by Danish fishermen. After a few months the marked plaice had, however, moved so far out to sea that about half of the landed specimens were recovered by foreign trawlers. It will be seen in the summary below that in the period after August 1903, 29 specimens of the marked plaice liberated in April, 1903, were recovered by Danish fishermen, and 26 by foreign trawlers. Of the specimens liberated in February, 1904, 17 specimens were recovered by Danish fishermen and 17 by foreign trawlers in the period after August, 1904. Of the specimens liberated in April, 1905, 14 specimens were recovered by Danish cutters and 19 by foreign trawlers after August, 1905.

The plaice fishery in the Skagerak on the continental slope of Jutland is almost exclusively carried on by Danish fishermen, as the stony condition of the bottom as a rule keeps foreign trawlers off the shallow water. It will be seen in Table 66 that about 99% of the plaice recovered in the Skagerak from the marking experiments in this water were captured by Danish fishermen. At the Swedish slope of the Skagerak, on the other hand, the majority of the plaice is caught by Swedish and German fishermen, but the stock of plaice is not very considerable there.

Table 63. The proportion of marked plaice caught by the various participating nations. Marking experiments in the Horns Reef Area in April 1903 No. 1, 2, 3 and 5. Depth below 20 m.

	Captured by Danish fishermen	Captured by English fishermen	Captured by German fishermen	Captured by Belgian fishermen	Total
1903 April	90	15	4	0	109
» May	98	11	1	0	110
» June	23	11	0	1	35
» July	4	4	3	0	11
» August	4	5	2	0	11
» Septbr.	0	1	2	0	3
» October	0	2	0	0	2
» Novbr.	3	1	0	0	4
» Decbr.	0	1	1	0	2
1904 January	0	1	0	0	1
» March	4	0	0	0	4
» April	5	3	0	0	8
» May	6	1	1	0	8
» June	5	1	0	0	6
» August	1	0	0	0	1
1905 February	0	0	1	0	1
» May	0	2	0	0	2
June	0	1	0	0	1
» July	1	0	0	0	1
Number	244	60	15	1	320
Percentage	76·3	18·8	4·7	0·3	

Table 64. The proportion of marked plaice caught by the various participating nations. Marking experiments in the Horns Reef Area in Febr. 1904. Depth below 20 m. Marking experiments No. 1 and 2, Transpl. exper. No. 1, 8 and 9.

	Captured by Danish fishermen	Captured by English fishermen	Captured by German fishermen	Captured by Dutch fishermen	Total
1904 March	10	1	0	0	11
» April	37	0	0	0	37
May	20	1	1	0	22
June	8	1	0	0	12
» July	7	0	1	1	9
» August	4	3	0	0	7
» Septbr.	2	1	0	0	3
» October	1	0	1	0	2
» Novbr.	1	1	1	0	3
1905 February	0	0	1	0	1
» March	1	1	0	0	2
April	1	0	1	0	2
May	3	1	1	0	5
June	2	2	0	0	4
July	2	0	0	0	2
» August	0	2	0	0	2
» Septbr.	0	1	0	0	1
Number	99	18	7	1	125
Percentage	79·2	14·4	5·6	0·8	

Table 65. The proportion of marked plaice caught by the various participating nations. Marking experiments in the Horns Reef Area in April 1905. Mark. exper. No. 8, 9 and 10. Depth below 20 m.

	Captured by Danish fishermen	Captured by English fishermen	Captured by German fishermen	Captured by Belgian fishermen	Captured by Dutch fishermen	Total
1905 April	84	0	0	0	0	84
» May	62	5	1	0	0	68
» June	39	13	0	1	0	53
» July	20	4	1	1	0	26
» August	5	0	0	0	0	5
» Septbr.	6	4	1	0	0	11
» October	1	7	1	0	0	9
» Novbr.	0	0	1	0	0	1
1906 January	0	1	1	0	0	2
» April	1	1	0	0	0	2
» May	1	0	0	0	1	2
» June	0	1	0	0	0	1
» Septbr.	1	0	0	0	0	1
Number	220	36	6	2	1	265
Percentage	83·0	13·6	2·3	0·8	0·4	

Table 67 shows that the Danish fishermen have also caught the majority of the marked fish, which emigrated from the Skagerak and were recovered in other waters; 81·9 % of these were recovered by Danish fishermen and 14·9 % by English fishermen.

Table 66. Plaice recaptured in the Skagerak in the Danish experiments in the Skagerak by the fishing vessels of the different nations.

	Captured by Danish fishermen	Captured by Swedish fishermen	Captured by German fishermen	Captured by English fishermen	Total. Place of recovery known
Mark. exper. 1903	33	0	0	0	33
Transpl. exper. 1904	25	0	0	0	25
Mark. exper. 1905	255	1	1	2	259
Number	313	1	1	2	317
Percentage	98·7 %	0·3 %	0·3 %	0·6 %	100 %

Table 67. Plaice recaptured outside the Skagerak in the Danish experiments in the Skagerak by the fishing vessels of the different countries.

	Captured by Danish fishermen	Captured by Swedish fishermen	Captured by German fishermen	Captured by English fishermen	Total. Place of recovery known
Mark. exper. 1903	7	0	0	1	8
Transpl. exper. 1904	15	0	1	3	19
Mark. exper. 1905	55	2	0	10	67
Number	77	2	1	14	94
Percentage	81·9 %	2·1 %	1·1 %	14·9 %	100 %

In the Danish marking and transplantation experiments in the Kattegat in 1904 and 1905, 823 specimens were recovered between March 5th, 1904, and September 30th, 1906. Of these 741 were recovered in the Kattegat, 53 in the Skagerak, 5 in the North Sea, 3 in the Sound, and 1 in the Belt Sea, while the place of recovery is unknown for 20 specimens. Of the 741 specimens recovered in the Kattegat 728 were taken by cutters and smaller vessels, and 13 by steam-trawlers. Thus it will be seen that hardly 2% of the recovered marked fish were taken by steam-trawlers. Of the 728 specimens which were recovered by cutters and smaller vessels the 627 must be ascribed to Danish, the 101 to Swedish fishermen. Of the 13 trawl-caught fish 10 were taken by German fishermen, 1 by English, 1 by Danish and 1 by Swedish fishermen.

Of all the specimens recovered in the Kattegat 84·8% were taken by Danish fishermen. A similar percentage of the specimens which emigrated from the Kattegat before recapture were taken by Danish fishermen (see Table 68 and 69).

Table 68. Number of marked plaice caught in the Kattegat by the fishing vessels of the different nations. Marking and transplantation experiments in the Kattegat. 1904—1905.

	Caught by Danish fishermen	Caught by Swedish fishermen	Caught by German fishermen	Caught by English fishermen	Total
Mark. & Transpl. exper., spring of 1904	84	21	0	0	105
Mark. exper., autumn of 1904	138	25	4	0	167
Mark. exper., spring of 1905	406	56	6	1	469
Number	628	102	10	1	741
Percentage	84·8%	13·8%	1·3%	0·1%	100%

Table 69. Number of marked plaice caught outside the Kattegat by the fishing vessels of the different nations. Marking and transplantation experiments in the Kattegat. 1904—1905.

	Caught by Danish fishermen	Caught by Swedish fishermen	Caught by German fishermen	Caught by English fishermen	Total
Mark. & Transpl. exper, spring of 1904	5	1	0	0	6
Mark. exper., autumn of 1904	21	1	3	2	27
Mark. exper., spring of 1905	26	1	0	2	29
Number	52	3	3	4	62
Percentage	83·9%	4·8%	4·8%	6·5%	100%

In the Tables 70, 71 and 72 a view is represented to show how many of the marked fish were recovered by the different fishing vessels during the different seasons in the Danish marking experiments in the Kattegat. The Tables comprise the specimens which have been recovered in the Kattegat as well as those recaptured outside the Kattegat.

Of the recovered specimens in the marking experiments in spring most were captured during the first months after liberation, and from the month of April a gradual decrease may be noticed in the number of recaptures for each month. Most of the specimens which were liberated in the autumn experiments were recovered during the spring months, March, April, May. Most of the trawl-caught fish were recaptured during the winter months and most of those recovered by Swedish cutters during the summer half-year.

Table 70. Number of marked plaice caught in the Kattegat by the various participating fishing vessels, in each month.
Mark. exper. No. 3, 4, 5 and Transpl. exper. No. 11. Kattegat, March, 1904.

	Caught by Danish Cutters and small boats	Caught by Swedish Cutters and small boats	Total
1904 March	19	4	23
» April	24	2	26
» May	5	3	8
» June	18	1	19
» July	7	11	18
» August	4	0	4
» Septbr.	3	0	3
» October	1	0	1
» Novbr.	1	0	1
1905 March	1	0	1
» July	1	0	1
Number	84	21	105
Percentage	80·0 %	20·0 %	100 %

Table 71. Number of marked plaice caught in the Kattegat by the various participating fishing vessels, in each month. Mark. exper. No. 6—14. Kattegat, October of 1904.

	Caught by Danish Cutters and small boats	Caught by Swedish Cutters and small boats	Caught by Danish Steam Trawlers	Caught by Swedish Steam Trawlers	Caught by German Steam Trawlers	Total
1904 October	9	0	0	0	0	9
» Novbr.	20	0	0	0	0	20
» Decbr.	19	0	0	0	0	19
1905 January	9	0	0	0	1	10
» February	10	1	0	1	2	14
» March	17	2	1	0	0	20
» April	9	1	0	0	0	10
» May	18	9	0	0	0	27
» June	7	3	0	0	0	10
» July	5	4	0	0	0	9
» August	0	1	0	0	0	1
» Septbr.	4	1	0	0	0	5
» October	3	1	0	0	0	4
» Novbr.	0	1	0	0	0	1
» Decbr.	0	0	0	0	0	0
1906 January	2	0	0	0	0	2
» February	2	0	0	0	0	2
» March	0	0	0	0	1	1
» April	1	0	0	0	0	1
» May	1	0	0	0	0	1
» June	1	0	0	0	0	1
Number	137	24	1	1	4	167
Percentage	82·0 %	14·4 %	0·6 %	0·6 %	2·4 %	100 %

Table 72. Number of marked plaice caught in the Kattegat by the various participating fishing vessels, in each month. Mark. exper. No. 1, 2, 6, 7. Kattegat, March and April of 1905.

	Caught by Danish Cutters and small boats	Caught by Swedish Cutters and small boats	Caught by English Steam Trawlers	Caught by German Steam Trawlers	Total
1905 March	89	0	0	1	90
» April	106	2	0	1	109
» May	81	22	0	0	103
» June	33	12	0	0	45
» July	32	14	1	0	47
» August	19	3	0	0	22
» Septbr.	16	0	0	0	16
» October	9	0	0	0	9
» Novbr.	3	1	0	1	5
» Decbr.	3	0	0	0	3
1906 January	2	0	0	1	3
» February	2	0	0	0	2
» March	3	0	0	2	5
» April	5	0	0	0	5
» May	0	0	0	0	0
» June	1	2	0	0	3
» July	1	0	0	0	1
» August	1	0	0	0	1
Number	406	56	1	6	469
Percentage	86·6 %	11·9 %	0·2 %	1·3 %	100 %

E. On the weight and value of all liberated specimens compared with the weight and value of the recaptured ones.

As I have explained elsewhere the marking experiments enable us in certain places to show that it will not pay to base the plaice fishery on plaice of a quite small size[1]. The experiments show in many cases that when we mark and liberate fish of a comparatively small size, the value of the recovered specimens will exceed that of all the liberated ones. This fact is of great importance when we try to elucidate how far it may be profitable to fix a size-limit for the plaice. In finding the size-group for which the value of all the liberated specimens is equal to the value of all the recovered ones we may be able to give an important hint as to which size-groups it will pay to protect. If we fix the size-limit where it appears that the value of all the liberated specimens corresponds with the value of the total recaptures we may be sure that it has not been fixed too high. The recorded recaptures are not the total recaptures, at any rate only a minimum. Some fish lose their labels, others die shortly after marking etc. (see p. 3—5, 18).

If in a certain water a size-limit for plaice has been imposed, this will influence the kind of gear used as well as where and with what intensity the fishery is carried on. In this way the size-limit will also exercise influence as to how many of the marked plaice are recovered and at which size they are recovered. Thus we may not by adopting the above mentioned measures once for all expect to get settled where the size-limit for the plaice may be fixed with the greatest advantage. But if a size-

[1] A. C. Johansen: Contributions to the biology of the plaice I. Medd. fra Komm. for Havunders. Ser. Fiskeri. Bd. I. No. 2. 1905 p. 27 30. — Ueber die Schollenfischerei im Kattegat und die Mittel, sie zu heben. Rapports et Procès-verbaux Vol. V, 1906, p. 119—121.

limit is imposed where there has been none before, or if a new size-limit is imposed in a place where there was one before the marking experiments ought to be repeated and the new results taken into consideration.

In the following a survey will be given over the value of all the liberated specimens of each size in the Danish marking experiments together with a view over the value of the recovered specimens. In the calculation of the value the scale set forth in Table 75 has been employed. This scale of value is based upon the veritable market prices for plaice of different sizes in Frederikshavn in the years 1904 and 1905[1]. The prices are first-hand wholesale prices. The quoted value refers to the plaice from the northern Kattegat and Skagerak. The same value is in the calculation in the following transferred to the plaice from the experiments in the Horns Reef area. No scale of value has hitherto been worked out for the less valuable plaice from the southern Kattegat, for which reason the experiments in the southern Kattegat have been left out of consideration in the following.

The value of the plaice increases with the length according to a more strongly rising scale than the weight. The values of plaice of different sizes and the proportions between these values changes, however, from time to time and from place to place. Calculations of value based upon market prices in a certain place during a certain brief period may therefore not be expected to have validity neither for long distances nor for a long time.

A comparison between the weight of all the liberated specimens of a certain size and the weight of all recovered specimens of the same initial size is also represented in the following. By this comparison it may be shown that the weight of all the recovered specimens in certain cases surpasses or very nearly approaches the weight of all the liberated specimens.

The scale on Table 73 has been employed for the plaice in the Horns Reef area. For plaice in the Skagerak and Kattegat the scale of weight on Table 74 has been employed.

Table 73. Relation between Length and Weight of Plaice captured in the Horns Reef Area. September, October. 1903 and 1904.

Length in cm.	Average weight in gram, observed	Average weight in gram, amended	No. of specimens weighed
12 cm.	19	19	40
13 »	23	23	40
14 »	28	28	40
15 »	35	35	40
16 »	44	42	40
17 »	50	50	40
18 »	58	58	40
19 »	65	66	40
20 »	74	76	40
21 »	88	88	40
22 »	102	102	40
23 »	119	117	40
24 »	128	133	40
25 »	152	150	40
26 »	168	168	40
27 »	188	188	40
28 »	210	210	40
29 »	235	235	30
30 »	262	262	17
31 »	300	300	4
32 »	338	330	3
33 »	375	365	1
34 »	400	400	1
35 »	425	430	2

[1] A. C. Johansen: Ueber die Schollenfischerei etc. l. c. p. 71.

Table 74. Relation between Length and Weight of Plaice captured in the Skagerak and Kattegat. September, October. 1903 and 1905.

Length in cm.	Average weight in gr., observed	Average weight in gr., amended	No. of specimens weighed	Length in cm.	Average weight in gr., observed	Average weight in gr., amended	No. of specimens weighed
15	36	36	9	35	434	440	23
16	45	45	13	36	463	480	23
17	55	55	12	37	531	520	22
18	66	66	7	38	598	570	21
19	78	77	9	39	628	620	20
20	85	88	6	40	665	670	21
21	98	100	7	41	695	720	15
22	110	113	3	42	768	770	15
23	123	127	8	43	855	830	9
24	143	143	18	44	930	900	10
25	171	163	21	45	980	980	5
26	181	185	20	46	958	1060	8
27	211	210	25	47	1180	1150	8
28	233	235	30	48	1224	1240	5
29	266	260	20	49	1390	1340	4
30	298	290	16	50	1480	1440	1
31	330	320	18	51	1590	1550	4
32	350	350	12	52	1540	1660	1
33	367	380	27	53	1820	1770	1
34	402	410	27	54	1833	1880	2

Table 75. Relation between Length and Value of Plaice.

Length in cm.	Value in Øre	Length in cm.	Value in Øre	Length in cm.	Value in Øre
20	1	32	17	44	54
21	1·3	33	20	45	59
22	1·5	34	23	46	64
23	1·8	35	26	47	69
24	2·3	36	29	48	74
25	3·3	37	31	49	80
26	5	38	34	50	86
27	7	39	37	51	93
28	9	40	40	52	100
29	11	41	43	53	106
30	13	42	46	54	113
31	15	43	50	55	120

The Tables 76, 77 and 78 give a comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice of 20—32 cm. liberated in the three years 1903, 1904 and 1905, in the ordinary marking experiments in spring in the Horns Reef area.

While Table 76 shows that the value of all liberated specimens surpasses the value of all the recovered ones, when we regard each size group separately, the Tables 77 and 78 give quite another picture. Here we see that the value of the recovered specimens surpasses the value of all the liberated ones, both when we regard most of the size groups separately and when we look at the total number of specimens.

In the experiments in 1904, 39 specimens of 26—30 cm. length and of a total value of 289 Øre were liberated. Thirty of these specimens were recovered, and these had at recovery a value of 344 Øre.

The time that passed between liberation and recovery was on an average 3 à 4 months. In the experiments in 1905, 156 specimens of a length of 26—30 cm. and of a total value of 1134 Øre were liberated. Of these were recovered 113 specimens, the total value of which was 1243 Øre at recovery. Only ca. 2 months passed on an average between liberation and recovery.

The experiments in 1906 seem to yield a still higher percentage of recaptures than the experiments in 1904 and 1905. The proportionately slight percentage of recaptures in 1903 must thus — if it really represented a reliable view of the intensity with which the fishing was carried on in the Horns Reef area at that time (what is very doubtful, however) — be regarded as a passed stage.

The experiments in 1904—1905 point in the direction that fish below 30 cm. might be protected with advantage in the Horns Reef area when we consider the interests of all the nations concerned, but the Tables 76—78 convey the impression that it would not be advisable for Denmark alone under the present conditions to raise the Danish size-limit (ca. 25·6 cm.) for the plaice in the North Sea. Of the 39 specimens of a length of 26–30 cm. of a total value of 289 Øre and liberated in 1904 the Danish fishermen recovered 24 specimens of a total value of 230 Øre at recovery. Of the 156 specimens of 26—30 cm. liberated in 1905, total value 1134 Øre, the Danish fishermen recovered 94 specimens of a value of 894 Øre at recovery. The value of the specimens recovered by Danish fishermen is thus somewhat less than the value of all the liberated fish.

To judge from the Tables 77 and 78 it would be natural to suppose, that the present Danish size-limit for the North Sea plaice, which only regards Danish fishermen, neither brings us much loss nor much profit.

Table 76. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size.

Marking experiments in the Horns Reef Area. April, 1903. Exper. No. 1, 2, 3, 4, 5.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column									
				Total No. of recovered specimens				Recovered by Danish fishermen			Recovered by foreign Trawlers		
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	Average time passed between liberation and recovery	No.	Value in Øre	Average time passed between liberation and recovery	No.	Value in Øre	Average time passed between liberation and recovery
20	30	30	2280	6	c. 12	639	c. 7 months	3	c. 5	c. 9 months	3	c. 7	c. 5 months
21	50	65	4400	8	c. 26	1070	c. 8 »	6	c. 22	c. 9 »	2	c. 4	c. 5 »
22	72	108	7344	12	c. 34	1501	c. 3 »	7	c. 26	c. 4 »	5	c. 9	c. 2 »
23	92	166	10764	22	c. 76	3132	c. 4 »	12	c. 41	c. 4 »	10	c. 34	c. 3 »
24	115	265	15295	35	c. 166	5774	c. 3 »	26	c. 89	c. 2 »	9	c. 78	c. 7 »
25	120	396	18000	32	c. 143	5219	c 2 »	27	c. 125	c. 3 »	5	c. 18	c. 1 »
26	111	555	18648	49	335	9306	c. 2 »	36	212	c. 1 »	13	123	c. 5 »
27	78	546	14664	40	302	7765	c. 1 »	33	251	c. 1 »	7	51	c. 1 »
28	85	765	17850	41	401	9036	c. 1 »	32	298	c. 1 »	9	103	c. 4 »
29	49	539	11515	22	248	5262	c. 1 »	20	222	c. 1 »	2	26	c. 3 »
30	36	468	9432	19	277	5431	c. 2 »	16	225	c. 2 »	3	52	c. 3 »
31	13	195	3900	7	112	2195	c. 1 »	6	92	c. 1 »	1	20	c. 5 »
32	20	340	6600	10	179	3405	c. 1 »	9	156	c. 1 »	1	23	c. 2 »
	871	4438	140692	303	c. 2311	59735	c. 2 months	233	c. 1764	c. 2 months	70	c. 548	c. 4 months

The experiments in the Skagerak in spring of 1903 suggest that it does not pay to land plaice from this water of a smaller size than ca. 23 cm. (see Table 79 p. 111). For the rest, the results of

Table 77. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size.

Marking experiments in the Horns Reef Area. February, 1904. Exper. No. 1 and 2.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column									
				Total No. of recovered specimens				Recovered by Danish fishermen			Recovered by foreign Trawlers		
	No	Value in Øre	Weigth in gr.	No.	Value in Øre	Weight in gr.	Average time passed between liberation and recovery	No.	Value in Øre	Average time passed between liberation and recovery	No.	Value in Øre	Average time passed between liberation and recovery
20	38	38	2888	12	34	1451	c. 6 months	10	31	c. 7 months	2	3	c. 3 months
21	54	70	4752	9	66	1646	c. 9 »	6	17	c. 4 »	3	49	c. 17 »
22	34	51	3468	11	53	1684	c. 5 »	9	42	c. 5 »	2	11	c. 5 »
23	17	31	1989	9	51	1544	c. 6 »	8	36	c. 4 »	1	15	c. 15 »
24	12	28	1596	6	23	900	c. 2 »	6	23	c. 2 »	..	..	...
25	11	36	1650	7	32	1140	c. 3 »	7	32	c. 3 »	..	..	...
26	12	60	2016	9	60	1709	c. 3 »	7	35	c. 2 »	2	25	c. 5 »
27	13	91	2444	10	104	2342	c. 3 »	8	72	c. 3 »	2	32	c. 6 »
28	10	90	2100	8	128	2460	c. 5 »	7	91	c. 3 »	1	37	c. 21 »
29	2	22	470	1	15	300	c. 3 »	1	15	c. 3 »	..	..	...
30	2	26	524	2	37	695	c. 4 »	1	17	c. 2 »	1	20	c. 7 »
31	1	15	300	1	15	300	c. 2 »	1	15	c. 2 »	..	..	...
	206	558	24197	85	618	16171	c. 5 months	71	426	c. 4 months	14	192	c. 9 months

Table 78. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size.

Marking experiments in the Horns Reef Area. April, 1905. Exper. No. 8, 9, 10.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column									
				Total No. of recovered specimens				Recovered by Danish fishermen			Recovered by foreign Trawlers		
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	Average time passed between liberation and recovery	No.	Value in Øre	Average time passed between liberation and recovery	No.	Value in Øre	Average time passed between liberation and recovery
21	2	3	176	..	...	...	...	..	...	...	..	..	...
22	3	5	306	..	...	...	...	..	...	...	..	..	...
23	61	110	7137	38	219	6624	c. 3 months	29	126	c. 2 months	9	93	c. 6 months
24	74	170	9842	51	221	8096	c. 2 »	40	153	c. 2 »	11	68	c. 4 »
25	89	294	13350	63	406	11796	c. 2 »	57	353	c. 1 »	6	53	c. 3 »
26	54	270	9072	39	292	7783	c. 1 »	37	276	c. 1 »	2	16	c. 2 »
27	50	350	9400	36	354	8095	c. 2 »	30	250	c. 1 »	6	104	c. 4 »
28	31	279	6510	22	337	6531	c. 3 »	15	192	c. 2 »	7	145	c. 5 »
29	19	209	4465	14	230	4402	c. 2 »	11	163	c. 2 »	3	67	c. 3 »
30	2	26	524	2	30	592	c. 1 »	1	13	c. $^1/_2$ »	1	17	c. 2 »
	385	1716	60782	265	2089	53919	c. 2 months	220	1526	c. $1^1/_2$ months	45	563	c. 4 months

the experiments in 1903 and 1905 do not invite the consideration of any essential change of the Danish size-limit for the plaice in the main part of the Skagerak.

It should be remembered that the experiments in spring, 1905, cannot yet be regarded as completely finished.

Table 79. Comparison of the value and weight of recovered plaice with the value and weight of the total number of plaice liberated, at each size. Marking experiments in the Skagerak. April, 1903.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column			Average time passed between liberation and recovery
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	
15–19	43	0	2484	5	11	544	c. 3 months
20	10	10	880	3	28	628	c. 5 »
21	7	9	700	4	57	1178	c. 9 »
22	8	12	904	3	14	522	c. 2 »
23	5	9	635	1	2	143	c. 1/3 »
24	7	16	1001	2	5	286	c. 1/2 »
25	2	7	326	1	3	163	c. 2 »
26	5	25	925	1	5	185	c. 0 »
27	3	21	630	1	17	350	c. 4 »
28	4	36	940	3	44	930	c. 2 »
29	7	77	1820	3	41	900	c. 1 »
30	5	65	1450	3	41	900	c. 1 »
31	3	45	960	2	30	640	c. 1 »
32	3	51	1050	3	78	1320	c. 3 »
33	3	60	1140	3	69	1230	c. 2 »

Table 80. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size. Marking experiments in the Skagerak. March, 1905. Exper. No. 3 and 4.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previons column			Average time passed between liberation and recovery
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	
22	3	5	339	..	...	...	....
23	27	49	3429	5	20	817	c. 3 months
24	35	81	5005	7	55	1534	c. 4 »
25	83	274	13529	26	186	5530	c. 3 »
26	103	515	19055	37	300	8325	c. 3 »
27	144	1008	30240	65	661	16385	c. 3 »
28	151	1359	35485	68	882	19545	c. 3 »
29	136	1496	35360	71	1005	21590	c. 3 »
30	69	897	20010	44	749	15080	c. 3 »
31	21	315	6720	10	170	3440	c. 2 »
32	1	17	350	..	...	...	....
33	1	20	380	1	20	380	c. 1 »

The experiments in the Kattegat have given some very interesting results with respect to the value of the recovered specimens in proportion to the value of all the liberated fish (Table 84). From the experiments in March and October, 1904, as well as from the experiments of 1905 it has become evident that the size at which the value of all the recovered specimens is equal to the value of all the liberated ones is higher than the present Danish size-limit for the Kattegat plaice (ca. 25·6 cm.). In the experiments in March, 1904, this size will be found at 28—29 cm., in the experiments in October, 1904, at 26 cm. and in the experiments in March, 1905, at 26—27 cm.

This is the most important result of the Danish marking experiments in 1903—1905 and invites the consideration of an international size-limit for the Kattegat plaice somewhat higher than the present Danish one[1]. Table 84 is a summary of the Tables 81, 82 and 83 as far as the specimens between 22 and 36 cm. are concerned. It is here obvious that up to and with a size of 26 cm. the value of all the recovered specimens surpasses greatly the value of all those liberated.

It should be remembered here, that the experiments in 1905 cannot yet be regarded as finished, and that at any rate one of the largest of the experiments in 1905 (No. 6) was not quite successful. The greater importance should therefore be attached to the fact, that the size at which the value of all the recovered specimens is equal to the value of all those liberated is as high as 26—27 cm.

Table 81. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size. Marking experiments in the northern Kattegat. March, 1904. Mark. exper. No. 3, 4, 5. Trpl. exper. No. 11. Comprise recaptures until Septbr. 30., 1906.

Length in cm.	Liberated fish			Recovered specimens of those mentioned in the previous column			Average time passed between liberation and recovery
	No.	Total value in Øre	Total weight in gr.	No.	Total value in Øre	Total weight in gr.	
21	7	9	700	4	7	483	c. 2 months
22	20	30	2260	18	91	3176	c. 4 »
23	19	34	2413	11	62	2068	c. 3 »
24	39	90	5577	30	171	5767	c. 3 »
25	20	66	3260	14	81	2724	c. 2 »
26	20	100	3700	12	110	2855	c. 3 »
27	12	84	2520	11	95	2545	c. 1 »
28	5	45	1175	5	53	1285	c. 1 »
29	4	44	1040	3	35	810	c. 1/2 »
30	1	13	290	1	15	320	c. 1 »
31	1	15	320	1	15	320	c. 1 »
32	2	34	700	2	34	700	c. 1/2. »

Table 82. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size. Marking experiments in the middle and northern Kattegat. October 1904. (Mark. exper. No. 6—13.)

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column			Average time passed between liberation and recovery
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	
20	2	2	176	1	2	127	c. 7 months
21	5	7	500	1	5	185	c. 9 »
22	10	15	1130	7	32	1173	c. 5 »
23	10	18	1270	8	31	1308	c. 4 »
24	17	39	2431	10	58	1925	c. 4 »
25	9	30	1467	7	48	1451	c. 6 »
26	15	75	2775	8	75	1925	c. 5 »
27	17	119	3570	9	83	2140	c. 3 »
28	13	117	3055	10	122	2790	c. 4 »
29	14	154	3640	10	132	2930	c. 4 »
30	13	169	3770	7	112	2300	c. 4 »
31	13	195	4160	10	191	3710	c. 4 »
32	21	357	7350	12	283	5110	c. 6 »
33	14	280	5320	4	92	1640	c. 3 »
34	9	207	3690	5	127	2180	c. 3 »
35	10	260	4400	4	117	1960	c. 4 »
36	10	290	4800	3	108	1810	c. 8 »

[1] A. C. Johansen: Ueber die Schollenfischerei im Kattegat etc.

Table 83. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size. Mark. exper. in the Kattegat. March, 1905. Exper. No. 1, 2, 6, 7.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column			Average time passed between liberation and recovery
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	
21	3	4	300	...	...	...	....
22	50	75	5650	25	67	3379	c. 3 months
23	53	95	6731	29	130	4979	c. 4 »
24	67	154	9581	31	143	5473	c. 3 »
25	75	248	12225	40	233	7835	c. 3 »
26	91	455	16835	57	476	12990	c. 3 »
27	63	441	13230	42	411	11220	c. 2 »
28	81	729	19035	51	601	13900	c. 3 »
29	92	1012	23920	66	852	18950	c. 2 »
30	73	949	21170	56	876	18140	c. 2 »
31	36	540	11520	28	510	10100	c. 3 »
32	37	629	12950	26	491	10390	c. 3 »
33	27	540	10260	23	559	9950	c. 3 »
34	18	414	7380	14	347	6330	c. 3 »
35	13	338	5720	7	188	3160	c. 4 »
36	13	377	6240	12	387	6470	c. 3 »

Table 84. Comparison of the value and weight of recaptured plaice with the value and weight of the total number of plaice liberated, at each size. Mark. exper. in the middle and northern Kattegat. 1904 and 1905.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column			Average time passed between liberation and recovery
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	
22	80	120	9040	50	190	7728	c. 4 months
23	82	147	10414	48	223	8355	c. 4 »
24	123	283	17589	71	372	13165	c. 3 »
25	104	344	16952	61	362	12010	c. 3 »
26	126	630	23310	77	661	17770	c. 3 »
27	92	644	19320	62	589	15905	c. 2 »
28	99	891	23265	66	776	17975	c. 3 »
29	110	1210	28600	79	1019	22690	c. 2 »
30	87	1131	25230	64	1003	20760	c. 2 »
31	50	750	16000	39	716	14130	c. 3 »
32	60	1020	21000	40	808	16200	c. 4 »
33	41	820	15580	27	651	11590	c. 3 »
34	27	621	11070	19	474	8510	c. 3 »
35	23	598	10120	11	305	5120	c. 4 »
36	23	667	11040	15	495	8280	c. 5 »

In the transplantation experiments in the North Sea and Skagerak, it has constantly been experienced that the value of the recovered specimens did not by far approach the value of those liberated, irrespective of which size-groups we consider. In a transplantation experiment with plaice transferred from Aalbæk Bay to Trindelen in the northern Kattegat in March, 1904, the matter has been different, as the value of the recovered specimens has been considerably greater than the value of the liberated fish of 22—26 cm. length (see Table 85). This experiment suggests further to investigate if it will pay to

transplant young plaice from the rearing grounds in the Nissum Bredning or the Horns Reef area to the areas of the middle Kattegat which are poor on young plaice.

Table 85. Comparison of the value and weight of recovered plaice with the value and weight of the total number of plaice liberated, at each size. Transplantation experiment No. 11, 1904.

Length in cm.	Liberated specimens			Recovered specimens of those mentioned in the previous column			Average time passed between liberation and recovery
	No.	Value in Øre	Weight in gr.	No.	Value in Øre	Weight in gr.	
21	5	7	500	2	3	240	c. 2 months
22	13	20	1469	11	61	2013	c. 4 »
23	13	23	1651	5	37	1066	c. 4 »
24	19	44	2717	14	78	2663	c. 3 »
25—26	10	43	1762	3	49	990	c. 10 »
	60	137	8099	35	228	6972	c. 4 months

F. Concluding remarks on the importance of the experiments in practical regard.

The Danish marking and transplantation experiments in the years 1903—1906 have in several respects yielded results which are of importance when we try to answer the three burning questions concerning the plaice fishery: the size-limit question, the fishing-gear question and the transplantation question.

The question about legislative interference with the plaice fisheries has often been connected too intimately with the question whether the plaice fisheries are deteriorating or not. If we possess means to increase the yield of the fisheries and thus make the fishing more profitable we ought naturally to employ them, even if the available evidence suggested that the fisheries were not deteriorating[1].

That the stock of plaice has been treated in an uneconomical manner for many years ought not to be a sufficient reason to treat it in the same manner for ever.

1. The size-limit question.

a. The Kattegat.

In a previous paper: "Ueber die Schollenfischerei im Kattegat und die Mittel, sie zu heben" I have dealt with the question whether we possess any means to increase the yield of the plaice fishery in the Kattegat. My conclusion is that the establishment of an international size-limit somewhat higher than the present Danish one (25·6 cm.) would in all probability be very advantageous. The principal facts bearing on this question and arrived at by the marking experiments are as follows:

1) It has been found in the marking experiments that the value of the fish recaptured exceeded the original value of the entire series thrown overboard when we regard the sizes below 27 cm. (see p. 111—113).

2) The fishery in the Kattegat is carried on so intensively that more than 60 % of the liberated marked plaice were registered as recovered within the first year after liberation (see p. 98).

3) Specimens from 20—29 cm. increase on an average ca. 6—8 cm. in the course of one year (see p. 66—69).

If we take a growth of 7 cm. as the normal one, we get the following increase in value during one year (see p. 108).

[1] Comp. C. G. Joh. Petersen: Report VI from the Danish Biological Station. København 1897.

Specimens	of a	length	of	20	cm.	increase	in value	from 1	to 7 Øre.
»	»	- 21	»	»		»		1·3 - 9	»
»	»	- 22	»	»		»		1·5 - 11	»
»	»	- 23	»	»		»		1·8 - 13	»
»	»	- 24	»	»		»		2·3 - 15	»
»	»	- 25	»	»		»		3·3 - 17	»
»	»	- 26	»	»		»		5 - 20	»
»	»	- 27	»	»		»		7 - 23	»
»	»	- 28	»	»		»		9 - 26	»
»	»	- 29	»	»		»		11 - 29	»

5) More than 92% of the plaice recovered in the Danish marking experiments in the Kattegat were again captured in the Kattegat (see p. 85).

6) The evidence arrived at from the marking experiments is that at least as many plaice migrate from the Skagerak to the Kattegat as vice versa (see p. 85—88).

b. The Skagerak.

The plaice fishery in the Skagerak is at present carried on in a rather satisfactory manner. On the coastal grounds where many young plaice are living, namely off the NW. coast of Jutland, the fishery is only carried on by gear that spares the young fish and for those a rather considerable size-limit is established as far as Denmark is concerned. And this is at present almost sufficient, as the coast-belt from 0—50 meters off the north-western coast of Jutland is almost entirely visited by Danish fishermen.

At depths from ca. 50—ca. 100 meters a not inconsiderable number of plaice are captured by Danish and Swedish cutters and by German and English trawlers; but the plaice living at this depth are so large that there would be no reason to protect them by a size-limit.

As the plaice fishery is carrried on with great intensity in the parts of the Skagerak nearest on the border of the Kattegat, especially on the stretch Skagen—Spirbakken, and as the majority of the plaice are also here caught by gear, that does not hurt the young specimens, it would be reasonable to place these parts of the water together with the Kattegat when an international size-limit for the plaice is to be imposed.

The results of the marking experiments in the Skagerak recommend that Denmark should retain a size-limit for the plaice in this water even if the foreign countries would not join us (see Table 79 p. 111 etc.).

c. The North Sea.

The question about an international size-limit for the plaice in the North Sea is of great importance, firstly for England, secondly for Germany, Holland, Belgium and Denmark. In its whole extent the question will not be discussed here. We may only here call attention to the fact, that the results of the Danish experiments in the Horns Reef area in 1904 and 1905, suggest that it is probably uneconomical to land plaice of a smaller size than ca. 30 cm. from this area when we regard the profit of all the nations concerned. The experiments show that the value of the specimens recaptured exceeded the original value of all the specimens thrown overboard (see the Tables 77 and 78 p. 110).

If we regard Denmark's profit alone, it is rather doubtful how far the size-limit (of 25·6 cm.) which is only in force for Denmark is an advantage or loss for us as long as a similar size-limit is not imposed for other nations. The experiments in 1904 and 1905 point in the direction that it has neither brought us much advantage nor much loss (see the Tables 77 and 78 p. 110).

As many of the young plaice, which are spared by the Danish fishermen on account of the

Danish size-limit, move out into the off-shore grounds later on, and are caught there by English and German trawlers it can hardly be doubted that this size-limit is profitable to England and Germany.

How far it would be advantageous for Denmark to accept such a high international size-limit as 30 cm. for the plaice in the North Sea is doubtful at present. The question about this is very complicated, as among others we would have to consider on the one side, that gradually as the plaice grow up they migrate out into deeper water where the foreign fishery at present predominates, and on the other side that such a size-limit would probably keep foreign trawlers at a considerable distance from the coasts of Jutland.

2. The fishing-gear question.

It has for years been a highly discussed question how far and under what circumstances it is injurious to the plaice fishery to employ gear which hurt or kill the young immature fish. This matter must be regarded in the light of the question about the frequency of the young "undersized" plaice. In the case of over-production it will probably do no harm to kill a greather part of them. But if there is ample room and food for them all it will be bad economy to use gear which destroy them in great numbers.

The investigations regarding the frequency of young plaice in the North Sea, Skagerak and Kattegat point plainly in the direction that no over-production of "undersized" fish takes place. There is in all probability ample room and food for many more than there exist. There are assuredly areas where we find over-population of young fish, as among others may be seen from the fact that the specimens grow relatively slowly. But these places are of slight extent in proportion to the areas where there is but a thin population, but enough food for the fish, as among other things may be seen from the fact that the few specimens living there grow relatively quickly.

If a steam-trawler is fishing on a rearing ground where there is over-population of young fish, it may perhaps be of some use at the very place to kill a lot of specimens which take up the room for others and restrain the growth of these[1]. But the use which the trawler possibly does in such a place probably does not compensate for the great mischief it causes by destroying fish, which later on might have migrated out to less populated areas where they would have increased proportionately quickly in size.

In the Danish marking experiments with undersized plaice of ca. 15—25 cm. length it has been ascertained that a quite considerable percentage — in the North Sea ca. 16·2 %, in the Kattegat ca. 35·6 % are known to have been recovered as undersized fish in spite of the fact that such small fish lose their labels easily (see p. 98—100). This points in the direction that the number of undersized fish is very limited and that we ought to treat this stock with care.

In the Kattegat and Skagerak the plaice fishery by ottertrawl or other gear destructive to the young plaice is only carried on to a slight extent on the rearing grounds. An extensive trawl-fishery takes place on the contrary in the North Sea on the rich rearing grounds off the continental coasts at depths below 30 meters.

At the same time as the question about a size-limit for the plaice in the North Sea is treated, we ought also to consider the question: how to keep the fishing vessels which destroy multitudes of young fish off the rearing grounds. It is worth while to consider if this had better be done by simply prohibiting these vessels to fish on these grounds or by imposing so high a size-limit for this class of vessels that the fishery in this way is rendered unprofitable on these grounds. A lower size-limit might very well be in force for the smaller vessels using fishing gear which were not injurious to the stock of small plaice. We might thereby gain that only this last class of vessels fished on the rich rearing grounds.

[1] Comp. W. Garstang: Provisional Report on the Natural History of the Plaice. Rapports et Procès-Verbaux. Vol. III. 1905.

3. The transplantation question.

The question how far it will pay to transplant young plaice in the open sea from grounds where they are exceedingly numerous and grow slowly to grounds where they are scarce and increase rapidly was raised in 1897 by Dr. PETERSEN[1]. The Danish experiments in 1903—1905 have to a certain degree elucidated this question with regard to the Skagerak and the Kattegat.

The marking and transplantation experiments in the Skagerak have shown that a very large percentage of the marked specimens migrate away from this water already in the course of a few months (see p. 82—83). This circumstance in connection with the fact that the investigations in 1905 gave the result, that there is a considerable stock of the 0-group in this water makes it unadvisable for economical reasons to transplant young plaice into the Skagerak in spite of the fact, that they increase quickly there.

A single transplantation experiment which took place in the Kattegat in spring of 1904 gave a very favourable result, as the transplanted specimens increased relatively quickly and a considerable percentage was recovered in the Kattegat itself.

This experiment ought to be followed by others on a somewhat larger scale as we have good reason to suppose that it will pay to transport young plaice from the rich rearing grounds in the North Sea or the Nissum Bredning to the middle Kattegat, where there are only few young plaice which increase with considerable rapidity (see p. 67—69).

Two facts revealed by the Danish experiments make in some cases the question about profitable transplantations of plaice in the open sea somewhat complicated. In the first instance it must be considered that the plaice may increase in size with a rather unequal rapidity in different years on the same grounds (p. 60—63). Secondly it plays a rôle that the transplanted specimens show a stronger inclination to change their dwelling place quickly than the not transplanted specimens (see p. 20 and p. 91—92).

Summary of Chap. III.

In this chapter I have wished, especially, to draw attention to the following points.

A. The rate of growth of plaice.

1) The males of the "northern" form of the plaice in the North Sea and the northern and middle Kattegat increase in growth with nearly the same rapidity as the females until they reach a size of ca. 30 cm. (see p. 59).

2) The plaice of ca. 20—29 cm. length in the Horns Reef area increase in length with a different rapidity in different years: The average increase per year has been as follows (see p. 62—63):

In 1903: ca. 4 cm.
In 1904: ca. 6 cm.
In 1905: ca. 7—8 cm.

3) There seems to be a connection between the rapidity of the growth of plaice in the Horns Reef area and the yield of the plaice fishery in that area, the yield being small in the years when the plaice grow slowly and great in the years when they grow rapidly (see p. 60—63).

4) The yearly average increase of plaice of ca. 24—31 cm. length in the Hanstholm—Søndervig area has been as follows (see p. 64):

[1] Report VI from the Danish Biological Station p 29—30. København 1897.

In 1903: ca. 8 cm.
In 1905: ca. 7—8 cm.(?)

5) The yearly average increase of plaice in the Skagerak has been as follows (see p. 65—66):

In 1903 for specimens of 15—24 cm. length ca. 10 cm.
» 1904 » transplanted specimens of 21—27 cm., length 7—8 cm.
» 1905 » specimens of 23—30 cm., length 7—8 cm.

6) The yearly average increase of plaice in the northern and middle Kattegat has been as follows in 1904 and 1905 (see p. 68—69):

for specimens of 20—29 cm. length: ca. 6—8 cm.
» » - 30—34 » » : » 5 »
» » - 35—39 » » : » 1·5 »

7) The mature females of ca. 26—36 cm. length in the southern Kattegat grow on an average only ca. 2 cm. a year (see p. 70).

B. The migrations of plaice.

1) The plaice show on the whole an inclination to migrate out into deeper water as they increase in size. But the migrations outward are not continual. In two periods of the year the grown up fish seek shallow water, namely in spring and autumn (p. 70—85).

2) The movements of the plaice influence very much the movements of the fishing boats, a fact which appears very clearly in the Horns Reef area (p. 76—80).

3) When the plaice in the beginning of the summer migrate out into deeper water from the Horns Reef grounds they move mainly in a north-western direction (p. 77—78).

4) The rich stock of young plaice of 2 and 3 years age in the Horns Reef area does not play any rôle worth mentioning for the renewal of the stock of plaice in the Skagerak and the Kattegat (p. 80).

5) The plaice in the Skagerak and the adjacent parts of the North Sea show a marked tendency to undertake long migrations in a relatively short time (Fig. 4 p. 19; Pl. V and VI; p. 80—82).

6) A great part of the plaice in the Skagerak emigrate to the North Sea and the Kattegat (p. 83, Fig. 4 p. 19; Pl. V and VI).

7) Between the stock of plaice in the Skagerak and the stock of plaice of the northern form in the northern and middle Kattegat a considerable exchange of specimens takes place. The migrations of plaice from the Skagerak to the Kattegat and vice versa play evidently a great economical rôle for the fishermen in Skagen (p. 85—86; Pl. I—VI).

8) The southern dwarf form of plaice in the southern Kattegat, the Belt Sea and the Baltic does not partake in the migrations to the Skagerak (p. 85).

9) It would seem that the number of plaice which move from the Skagerak to the Kattegat is greater than the number which go the opposite way (p. 85—87).

10) The larger plaice show a more marked tendency to emigrate from the Kattegat to the Skagerak than the smaller ones. For plaice moving from the Skagerak to the Kattegat we notice the reversed tendency (p. 86—88).

11) The marking experiments seem to show that specimens often go together during the migrations (p. 89—91).

12) Several specimens have moved with a rapidity of more than 2 miles per day. A few specimens seem to have wandered at least 5—6 miles per day (p. 91—92).

13) (The causes of migrations are discussed on p. 92—93).

C. The intensity of fishing.

1) The stock of marketable plaice is very much affected by the fishing. In the ordinary marking experiments in 1903—1906 the following number of plaice of 25 cm. and above has been recovered within twelve months after liberation (p. 94—98):

Area.	Month of Liberation	No. of spec. of 25 cm. and above liberated	No. of spec. recovered within 12 months	Percentage recovered within 12 months	Remarks
Horns Reef Area	April, 1903	522	219	42·0	
» » »	Febr., 1904	51	37	72·5	
» » »	April, 1905	248	176	71·0	
» » »	April, 1906	180	121	67·2	Recaught within 6 months
Hanstholm-Søndervig Area	April, 1903	56	23	41·1	
» » »	March, 1905	30	11	36·7	
Skagerak	April, 1903	41	24	58·5	
»	March, 1905	709	319	45·0	
Kattegat	March, 1904	55	46	83·6	
»	October, 1904	315	158	50·2	
»	March, April, 1905	627	415	66·2	

2) The stock of "undersized" plaice of ca. 16—24 cm. length is also much affected by the fishing. Of 1014 undersized plaice liberated off the west-coast of Jutland, in the North Sea and the Skagerak, 164 specimens or 16·2 % were recaptured within one year, before they had reached a size of 25 cm. In the same time were recaptured 81 specimens or 8·0 % which had reached a length of 25 cm. or above.

In the Kattegat the percentage of "undersized" fish recovered has been much higher than in the North Sea and the Skagerak. Of 253 "undersized" plaice liberated, 90 specimens or 35·6 % were recaptured as undersized fish within 12 months after liberation. In the same time 48 specimens or 19·0 % were recovered at a size of 25 cm. or above (p. 98—99).

D. The proportion of the marked fish caught by the various participating fishing vessels.

1) Of 752 plaice recovered in the North Sea and originating from the Danish marking and transplantation experiments in the Horns Reef area in 1903—1905, 594 specimens or 79·0 % were caught by Danish cutters and small boats, and 158 specimens or 21·0 % by foreign trawlers (p. 100).

2) The percentage of marked fish caught by Danish vessels and foreign trawlers on the various depths in the North Sea off the west-coast of Jutland was as follows (see p. 100—101):

Depth 0—10 meters: 42 specimens recovered, 97·6 % by Danish vessels, 2·4 % by foreign trawlers.
» 11—20 » : 454 » » 91·2 % - » » 8·8 % - » »
» 21—25 » : 126 » » 69·0 % - » » 31·0 % - » »
» 26—29 » : 29 » » 58·6 % - » » 41·4 % - » »
» above 30 » : 56 » » 19·6 % - » » 80·4 % - » »

3) The great majority of the recaptured specimens of the plaice liberated in the Horns Reef area at depths between 7—20 meters were during the first months after liberation recaptured by Danish fishermen. In the course of a few months the marked plaice had, however, moved so far out to sea that about half of the landed specimens were captured by foreign trawlers (p. 102—103).

4) About 99 % of the plaice recovered in the Skagerak in the Danish marking experiments in this water were taken by Danish fishermen (p. 103).

5) About 98% of the marked plaice recaptured in the Kattegat were taken by cutters and small boats; hardly 2% by steam-trawlers (p. 104).

6) Of 741 marked plaice recaptured in the Kattegat in the Danish experiments, 84·8% were caught by Danish fishermen, 13.8% by Swedish, 1·3% by German and 0·1% by English fishermen (p. 104).

E. On the weight and value of all the liberated specimens compared with the weight and value of the recaptured ones.

1) In the experiments in the Horns Reef area in April of 1903 the value of the liberated specimens of all size-groups surpasses the value of the recaptured ones (p. 109).

2) In the experiments in the Horns Reef area in February, 1904, and April, 1905, the value of the recovered specimens of 23—30 cm. original length is considerably higher than that of all specimens thrown over board. If we compare the value of all the liberated specimens at liberation with the value of the specimens recovered solely by Danish fishermen, we find the first mentioned group to be of the highest value (p. 110).

3) In the experiments in the Skagerak in April, 1903, the value of the recovered specimens of 20—22 cm. original length is considerably higher than the value of all the liberated ones (p. 111).

4) In the experiments in the Skagerak in April, 1903, and March, 1905, the value of the liberated specimens of 23—33 cm. is on the whole higher than the value of the recovered ones (p. 111).

5) In the Danish marking experiments in the Kattegat in 1904 and 1905 the value of the recovered specimens of 22—26 cm. original length is considerably higher than the value of all the liberated ones. From 27—31 cm. the value of the liberated ones exeeds a little the value of those recovered. From 32 cm. and upwards the value of the liberated ones is considerably higher than that of the recovered ones (p. 111—113).

6) In a transplantation experiment with plaice in the northern Kattegat in March, 1904, the value of the recovered specimens of 22—26 cm. original length was higher than the value of all those thrown over board (p. 113—114).

As to the importance of the marking and transplantation experiments in **practical regard** the section F: «Concluding remarks on the importance of the experiments in practical regard» (p. 114—117) must be referred to *in extenso*.

I am much indebted to Dr. H. M. Kyle, who has been good enough to read through the proofs.

Explanation of the Plates.

The Plates I—VI illustrate the Danish marking experiments with plaice in 1904 and 1905. The small circles indicate place of liberation. The arrow-heads indicate place of recovery. The Arabic numerals represent number of months between liberation and recovery. The letters beside the arrow-heads represent the nationality of the vessels which recaptured the plaice, B meaning Belgium, Da = Denmark, E = England, H = Holland (Netherlands), G = Germany, S = Sweden. In cases where no letters stand beside the arrow-head **Da** is omitted.

The migration-routes of the individual plaice are naturally unknown. We know only place of liberation and place of recapture.

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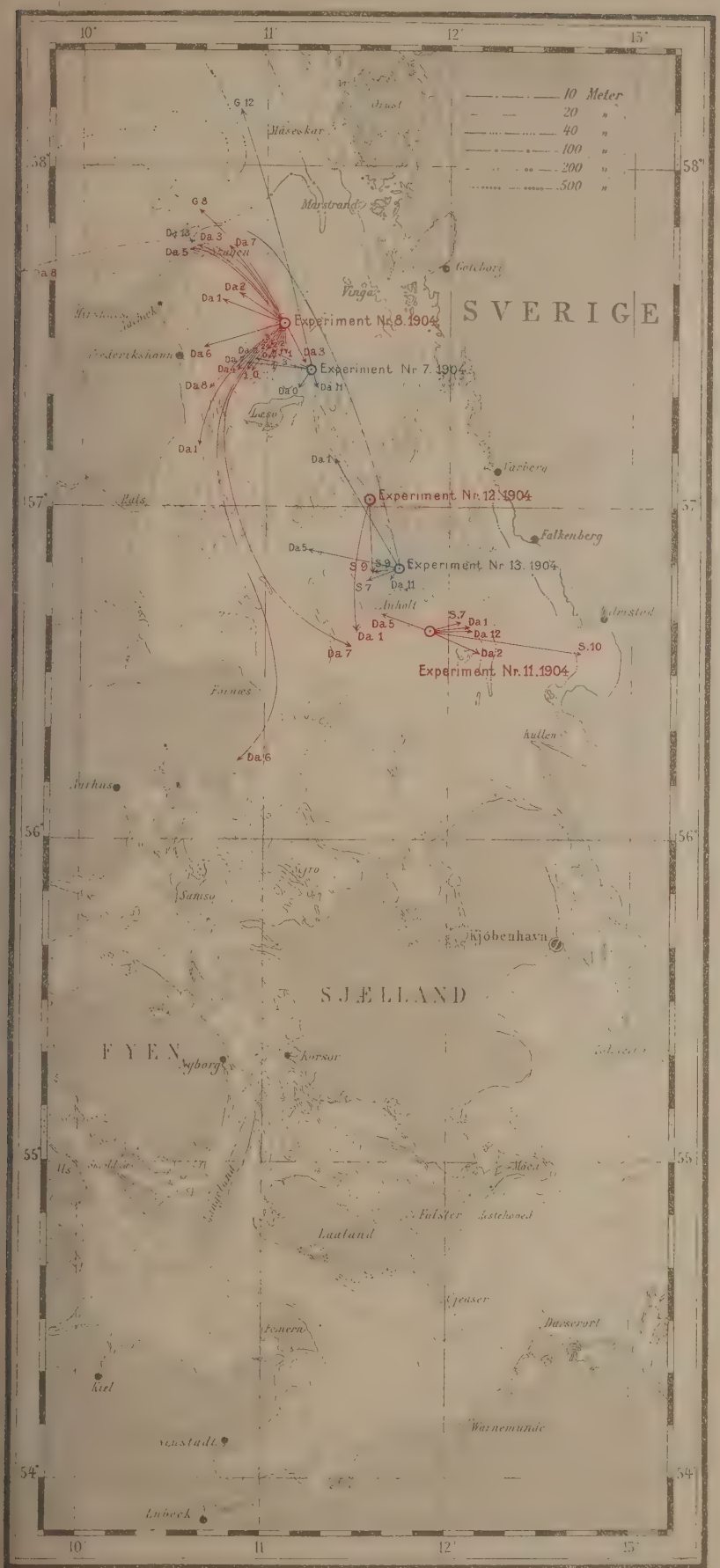

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